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UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT



**VERNAL
FIRE MANAGEMENT PLAN
ENVIRONMENTAL
ASSESSMENT**



UT-080-2004-0430



November 2005

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

ENVIRONMENTAL ASSESSMENT (EA) # UT – 080- 2004 -0430

Vernal Fire Management Plan EA

This unsigned FONSI and the attached EA #UT- 080- 2004- 0430 for the Vernal Fire Management Plan are available for public review and comment for 30 days beginning on January 17, 2006.

Based on the analysis of potential environmental impacts in the attached EA and consideration of the significance criteria in 40 CFR 1508.27, I have determined that with required and proposed protection measures the Vernal Fire Management Plan would not result in significant impacts on the human environment. An environmental impact statement (EIS) is not required.

The decision to approve or deny the Vernal Fire Management Plan, and if appropriate a signed FONSI with rationale, will be released after consideration of public comments and completion of the EA.

State Director

Date

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CHAPTER I. PURPOSE AND NEED

I.1 INTRODUCTION

This Environmental Assessment (EA) documents results of an analysis of proposed changes to the current management of wildland fire and hazardous fuels for the Bureau of Land Management (BLM) Vernal Field Office. Proposed revisions of the Vernal Fire Management Plan (FMP) serve as the Proposed Action for this EA. The revised FMP incorporates current planning requirements associated with fire management on public lands, including wildland fire suppression and fuel treatments. The EA analysis is designed to ensure compliance with the National Environmental Policy Act (NEPA). It allows determinations to be made as to whether any significant impacts, as defined by the President's Council on Environmental Quality (CEQ) in Regulation 40 CFR 1508.27, could result from the analyzed actions.

An EA provides evidence for determining whether preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) statement is necessary. A Decision Record (DR) that includes a FONSI statement is a document that briefly presents reasons why implementation of the Proposed Action would not result in significant environmental impacts (effects) beyond those already addressed within other NEPA and BLM planning documents. If the decision-maker determines that this project would have significant impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a DR may be signed for the EA approving the alternative selected. In the present case, the DR would identify fire management planning goals and objectives associated with the FMP and would provide language upon which future fire management planning and implementation actions could tier (as per 40 CFR 1502.20).

Issues identified for analysis within this EA are included as **Appendix A** (Interdisciplinary Team Analysis Record Checklist). This appendix includes the resource concerns identified in the EA (including those resources considered as critical elements of the human environment) and related issues derived from the BLM, affiliated agency resource reviews, and comments received during the public scoping process.

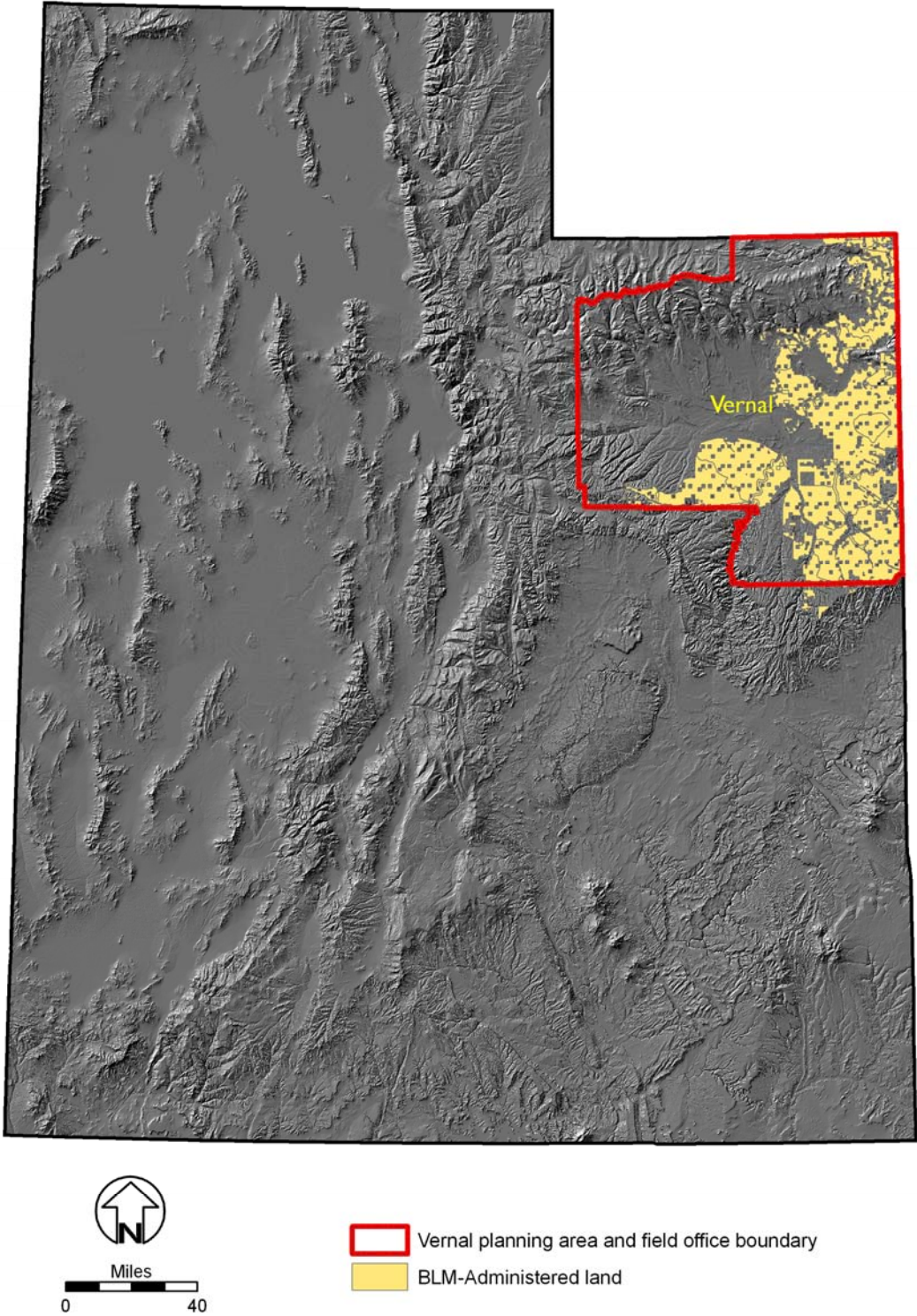
I.2 BACKGROUND

The Vernal Field Office evaluated its current FMP and determined that an update was needed to comply with current federal fire management direction. Applicable federal fire management direction is outlined in *Federal Wildland Fire Management Policy and Program Review* (USDI and USDA 1995); *USDI and USDA Implementaiton Action Plan Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDI and USDA 2001a); and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy* (USDI and USDA 2001b). Additionally, the focus on hazardous fuel treatments called for by the National Fire Plan and Healthy Forests Restoration Act of 2003 were not known at the time the current FMP was written.

The planning area for the EA encompasses approximately 2.5 million acres of land owned and managed by various entities (e.g., public, private, and state). BLM-administered lands within the Vernal planning area account for approximately 1.7 million of these acres. BLM lands in the planning area are administered by the Vernal Field Office. **Figure I.1** illustrates the Vernal Field Office boundaries and BLM-administered land within the planning area.

The acreages presented in this EA are approximate, due to slight variations in geographical information system (GIS) data sets. The variations represent an insignificant quantity of land area and have a negligible effect on analyses of fire management action impacts.

FIGURE I.1: VERNAL FIELD OFFICE BOUNDARY AND BLM-ADMINISTERED LAND WITHIN THE PLANNING AREA



I.3 NEED FOR PROPOSED ACTION

National fire management policy has evolved in response to increased fatalities, property losses, local economic disruption, risks to ecosystems associated with increasingly severe wildland fires, and increasing wildland urban interface (WUI) conflicts. National policy requires that federal land management agencies change their fire management practices to increase protection of human life and decrease natural resource and private property damage. Revision of the FMP would result in fire management direction that is compliant with national and interagency direction.

Federal Wildland Fire Management Policy and Program Review (USDI and USDA 1995) and *USDI and USDA Implementation Action Plan Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDA and USDI 2001a) directed that FMPs be developed for all areas of burnable vegetation on federal lands. Management direction is further organized within the revised FMP through the use of land area subdivisions called fire management units (FMUs).

The revised FMP formally documents the fire management program and is based on existing management framework plans and resource management plans (RMPs), both of which are known as land use plans (LUPs). FMPs incorporate the broader LUP management direction and are a fire manager's primary guide for planning, and in some instances, implementing fire-related direction on the ground.

The revised FMP would result in a document that provides for fire management direction compliant with national and interagency direction. The revised FMP would further the ultimate goals of improving firefighter and public safety, reducing fuel loads, and maintaining the ecological functions of landscapes within the Vernal planning area.

The following underlying objectives drive the need to revise the Vernal FMP:

- Protect human life. This would be the prime suppression priority. Setting priorities among protecting human communities and community infrastructures, other property and improvements, and natural and cultural resources would be done based on the values to be protected, human health and safety, and cost.
- Use the full range of fire management actions to achieve ecosystem sustainability.
- Reduce hazardous fuels.
- Restore ecosystems.
- Protect communities-at-risk.

Acreages in the Proposed Action are based on achieving these goals and objectives.

I.4 PURPOSE OF THE PROPOSED ACTION

The Director of BLM's Office of Fire and Aviation has instructed all field offices to develop a new FMP or revise their existing FMP. The revised FMP should identify and integrate all federal wildland fire management guidance, direction, and activities required to implement national fire policy, fire management policy, and program direction from the following: *Federal Wildland Fire Management Policy and Program Review* (USDI and USDA 1995); the *Interagency Strategy for Implementation of Federal Wildland Fire Management Policy* (BLM 2003a); and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy* (USDI and USDA 2001b).

Ecosystems have evolved with, and adapted to, specific fire regimes. Control and suppression of wildfires have altered natural frequencies, sizes, intensities, and seasons of occurrence and have resulted in increased

hazardous fuel loads, increases in understory and brush, and increases in stand density (Wright 1990, Covington and Moore 1994).

Two terms—fire regime and condition class—are used to describe natural fire processes and current departure from historic conditions. Fire regime is a description of natural fire return intervals associated with vegetation cover types (a further description of fire regime can be found in the glossary in Chapter 6). Condition class is a description of vegetation conditions based on the change from natural fire regime, including effects of fire suppression (fuel loading and encroachment) and species invasion. There are three condition class categories:

- FRCC 1: Within historical range for fire return interval and vegetation attributes
- FRCC 2: Moderately altered from historical range
- FRCC 3: Substantially altered from historical range and vegetation attributes

1.5 CONFORMANCE WITH BLM LAND USE PLANS

The proposed FMP is not in conformance with the Diamond Mountain RMP and Book Cliffs RMP. However, the proposed action would conform with the Vernal FO RMP Draft EIS (January 2005). The Decision Record for this FMP EA would not be signed, and implementation of the proposed action would not occur until after the RMP Record of Decision is signed.

1.6 RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

This document was prepared in adherence to relevant BLM NEPA and CEQ guidance for the completion of an EA. CEQ regulations for implementing NEPA (40 CFR parts 1500-1508) detail the process of preparing NEPA documents, while the Federal Land Policy and Management Act of 1976 (FLPMA 43 USC 1711) regulates the BLM's planning process. As required by FLPMA and BLM policy, resource management planning must take into account the principles of multiple use and sustained yield.

In addition to meeting the goals, objectives and intent of BLM planning guidance, other applicable fire management goals, policy statements and specific fire management decisions addressed by the proposed action include:

- Federal Wildland Fire Management Policy (1995) and Review and Update of the Federal Wildland Fire Management Policy (2001)
- A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy

In consideration of CEQ and BLM guidance and fire management requirements, the Proposed Action has been developed to also be in compliance with other applicable environmental laws, policies, and Executive Orders (EOs). These authorities include (but are not limited to) the Healthy Forests Restoration Act, Clean Air Act (CAA), Clean Water Act (CWA), Wild and Scenic Rivers Act (WSRA), Endangered Species Act (ESA), National Historic Preservation Act (NHPA), Archaeological Resource Protection Act (ARPA), Colorado River Basin Salinity Control Act, Utah's laws for air pollution, Utah BLM's Standards and Guidelines for Healthy Rangelands, Native American Trust Resource Policies, EO 11514 (Protection and Enhancement of Environmental Quality), EO 11593 (Protection and Enhancement of the Cultural Environment), EO 11988 (Management of Floodplains), EO 11990 (Management of Riparian and Wetlands), EO 12866 (Regulatory Planning and Review), EO 12898 (Consideration of Environmental Justice Issues), EO 13112 (Management of Invasive Species), and EO 13186 (Management of Migratory Birds). Specific land management and wildland fire management policies are shown in **Appendix B**.

The Proposed Action would be consistent with adjacent federal land agency, State of Utah and affiliated Native American tribal planning. These other planning efforts include the State of Utah Natural Hazard Mitigation Plan (Utah Department of Public Safety 2004) and ongoing local government planning. If inconsistencies are identified, the BLM would consider adjustments to fire and/or fuel treatments during project-specific planning through coordination with adjacent entities. Resources managed by other federal, state, and tribal agencies were also taken into consideration during the development of resource protection measures (RPMs) within the Proposed Action.

The proposed action would be consistent with the Vernal Field Office's *Normal Fire Year Rehabilitation Plan* (NFYRP) completed in 2003 (BLM 2003c). The NFYRP directs site-specific Emergency Stabilization and Rehabilitation (ESR) actions following wildfires.

1.7 IDENTIFICATION OF ISSUES

The proposed FMP would not conflict with other resource goals and objectives in the existing LUPs. However, the potential for impacts on resources in raises issues that are addressed by this EA. **Appendix A** presents the issues that were identified. These issues influenced development of the Proposed Action. Resources that are either not present within the planning areas or would not be affected by the Proposed Action are identified in **Appendix A** and are not included for analysis in this document. They include air quality, environmental justice, farmlands (prime or unique), wastes (hazardous or solid), visual resources, geology, mineral resources, paleontology, and lands and access. This section presents a summary of potentially affected resource issues.

1.7.1 ISSUES IDENTIFIED FOR ANALYSIS

Areas of Critical Environmental Concern

Impacts on the values that the ACECs were designated to address.

Cultural Resources

Impacts on cultural sites.

Floodplains

Impacts on the natural and beneficial use of floodplains.

Invasive, Non-Native Species

Potential for increased noxious weed infestation from unplanned fire.

Native American Religious Concerns

Impacts of fire on traditional cultural property (TCP) and areas of traditional cultural importance.

Threatened, Endangered, or Candidate Plant Species

Impacts on listed and candidate plant species from suppression.

Threatened, Endangered, or Candidate Animal Species

Impacts on listed and candidate animal species from unplanned actions.

Water Quality

Impacts on water quality.

Wetlands and Riparian Zones

Impacts on riparian areas from suppression and fuels management.

Wild and Scenic Rivers (WSRs)

Impacts on outstanding remarkable values, tentative classification.

Wilderness Study Areas (WSAs)

Impacts on naturalness, opportunities for solitude, and opportunities for primitive recreation in the WSAs

Livestock Grazing

Impacts on allotment use.

Woodlands and Forestry

Potential for vegetation conversion.

Vegetation, including Special Status Plant Species

Impacts on vegetation, including special status species (SSS), from fire.

Fish and Wildlife including Special Status Species

Impacts on fish and wildlife species, including SSS, and potential/occupied habitat.

Impacts on crucial seasonal habitat.

Soils

Impacts on soils.

Recreation

Impacts on developed recreation sites and facilities.

Fire and Fuels Management

Fire and fuels management considerations form the basis for the Proposed Action. Therefore, fire and fuels management impacts are considered and addressed in this EA. The objective of the FMP is to provide management direction for this resource, in consideration of other resources. As such there is no separate section in Chapter 3 or Chapter 4 for this resource.

Socioeconomics

Impacts on socioeconomics.

Wild Horses and Burros

Impacts on herd management area.

Wilderness Characteristics

Impacts from fire management actions to the naturalness, opportunity for solitude and primitive recreation, and any supplemental values.

CHAPTER 2. DESCRIPTION OF ALTERNATIVES

2.1 INTRODUCTION

This chapter describes and compares the Proposed Action and the No Action Alternative and addresses alternatives considered but dismissed. The Proposed Action complies with federal wildland fire management policy. It emphasizes protection of life and resources through wildland fire and fuels management and incorporates current scientific principles regarding benefits of wildland fire in the ecosystem while implementing cost-effective fire management techniques.

The No Action Alternative represents current fire management direction as directed in the Vernal Field Office *Fire Management Activity Plan* (BLM 1998a). It, too, prioritizes protection of life and resources, but contains fewer fuels management goals and opportunities for wildfire to benefit ecosystems.

The Vernal planning area boundary is the same for the No Action Alternative and the Proposed Action. However, the Vernal planning area is divided into 28 FMUs in the Proposed Action and 23 polygons in the No Action Alternative. The boundaries of the polygons are similar in some instances, but not directly comparable. The definition of a polygon is not clearly defined in the No Action Alternative, but is linked to risk, values, and hazards within the Vernal planning area. In the Proposed Action, FMUs are delineated based on management objectives and constraints, topographic features, access, values to be protected, political boundaries, fuel types, FRCC, and other distinguishing characteristics. Both alternatives use the following categories to define where and to what degree both planned (prescribed fire) and unplanned (wildland fire) are appropriate.

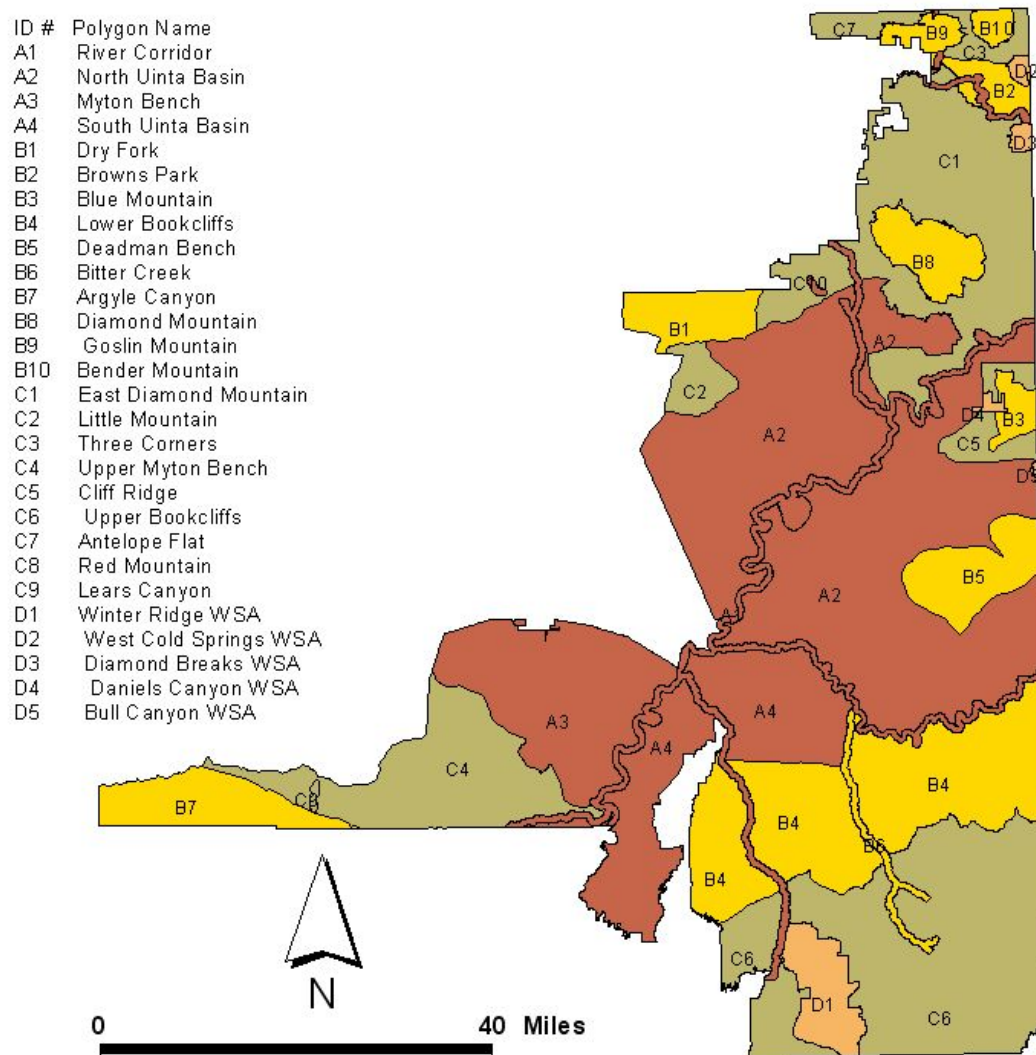
- *Category A:* Fire is not desired at all.
- *Category B:* Unplanned fire is not desired, but prescribed fire and/or non-fire fuel treatments may be used to achieve resource objectives. Mitigation would likely be required to protect resources.
- *Category C:* Fire is desired. Constraints are present to protect values at risk. Prescribed fire and non-fire fuel treatments may also be used to achieve resource objectives. In the Proposed Action Alternative, wildland fire use may be allowed.
- *Category D:* Fire is desired. Wildland fire, prescribed fire, and non-fire fuel treatments may be used to achieve desired objectives. In the Proposed Action Alternative, wildland fire use may be allowed.

Appendix C presents a detailed definition of the categories. Greater detail regarding the alternatives is presented below.

2.2 PROPOSED ACTION

Twenty-eight FMUs that make up the Vernal planning area for the Proposed Action and fire management objectives for BLM-administered land are presented in **Figure 2.1**. Overall goals are discussed in Section 2.2.1 and fire management actions are presented in Section 2.2.3.

Figure 2.1: Fire Management Categories and Fire Management Units for the Proposed Action on BLM-Administered Land



CATEGORY

- A Wildland fire is not desired**
- B Unplanned fire is not desired**
- C Wildland fire is desirable to manage ecosystems**
- D Wildland Fire is desirable and there are few constraints**

2.2.1 OVERALL GOALS

The Proposed Action emphasizes strategic fire management planning that integrates resource management goals, objectives, and concerns with fire management activities. Overall criteria for development of the Proposed Action are as follows:

- Provide for firefighter and public safety.
- Work collaboratively with communities-at-risk within the WUI to develop plans for risk reduction.
- Allow fire to function in its ecological role, when appropriate for the site and situation, to help protect, maintain, and enhance public resources.
- Create an integrated approach to fire and resource management across landscape and agency boundaries. This approach would be designed to meet the desired outcomes of LUPs and RMPs.
- Provide a program that fosters interagency interaction, cooperation, and effectiveness for all fire management activities.
- Fire management actions would take into consideration costs, ecosystem or resource benefits, and values to be protected.

2.2.2 DESIRED WILDLAND FIRE CONDITIONS FOR THE PROPOSED ACTION

The general Desired Wildland Fire Conditions (DWFC) is to have ecosystems that are at a low risk of losing ecosystem components following wildfire and that function within their historical range. In terms of FRCC, the DWFC outside the WUI is to trend to a lower FRCC using the least intrusive method possible. In other words, the DWFC is to move lands in FRCC 3 to FRCC 2 and lands in FRCC 2 to FRCC 1 through fire and non-fire treatments where wildland fire use is the preferred method of treatment, when feasible. Inside the WUI, the general DWFC is to have less potential for values to be threatened by wildland fire, usually through some modification of fuels.

FIRE REGIME

Fire Regime refers to the historical fire frequency (called fire return interval) and the severity with which fire occurred. Vegetation types in the west developed under these fire regimes.

Fire Regime I low-severity fires with a frequency of 0-35 years.

Fire Regime II stand replacement fires with a frequency of 0-35 years.

Fire Regime III mixed-severity fires with a frequency of 35 to 100 years.

Fire Regime IV stand replacement fires with a frequency of 35-100 years.

Fire Regime V stand replacement or mixed-severity fires with a frequency of 200+ years.

In all fire management decisions, strategies and actions, firefighter and public safety would be the first and highest priority. The full range of management strategies and actions would be used to protect firefighter and public safety. This priority overrides all other strategies and actions. Further, the full range of fire management actions, consistent and integrated with other Land Use Plan decisions, would be used to help achieve ecosystem sustainability, including its interrelated ecological, economic and social components.

The following are general strategies and actions for all facets of the wildland fire management program, including suppression, wildland fire use, prescribed fire, non-fire fuel treatments, emergency stabilization and rehabilitation, prevention, and community protection:

- The appropriate management response would be provided to all wildland fires, emphasizing firefighter and public safety and considering suppression costs, benefits and values to be protected. The appropriate management response would be consistent with resource objectives, would be based on ecological and social costs, and benefits of the fire. The circumstances under which the fire occurs and the likely consequences to firefighter and public safety and welfare, natural and cultural resources and values to be protected, would dictate the appropriate management response to the fire.
- Wildland fire would be used to protect, maintain and enhance resources and, when possible, would be allowed to function in its natural ecological role.
- To reduce risks and to restore ecosystems, the following fuels management tools would be allowed throughout the Vernal Planning Area: wildland fire use, prescribed fire, and mechanical, chemical, seeding, and biological actions. As conditions allow, the BLM would employ the least intrusive method over more intrusive methods. For example, wildland fire use is the preferred method of treatment. Where wildland fire use is not feasible, prescribed burning would be the preferred method. Where prescribed burning is not feasible, non-fire fuel treatments would become the preferred method of treatment.
- Work with partners in the WUI in wildland firefighting, hazardous fuels reduction, cooperative fire prevention education and technical assistance. Unauthorized wildland fire ignitions would be prevented through coordination with partners and affected groups and individuals. The full range of prevention and mitigation activities would be used: personal contacts, mass media, education programs and signage.
- The following Emergency Stabilization and Rehabilitation (ESR) actions (following wildfire suppression) and restoration for planned actions may be utilized to reduce potential for soil erosion and invasive species spread: seeding or planting native and/or non-native species; applying approved herbicides; implementing soil stabilization measures (e.g., stabilization structures, mulches); protecting cultural resources; repairing or replacing facilities; fencing, herding or removing livestock and/or horses; and resting allotments. Specific actions could include brush/tree chopping; contour tree felling; silt catchments; waddles, straw or fabric silt traps; mulching; drill seeding; aerial seeding; aerial seeding followed by mechanical seed covering (chaining, harrowing or other mechanical means); planting seedlings; fence construction or rebuilding; road/trail maintenance or closures; cattle guards; road culvert installation or cleaning; water bars; sign installation and maintenance; herbicidal or mechanical weed treatments; weather station installation and maintenance; repairing or rebuilding of minor facilities (cross fencing, wildlife structures, recreational facilities). All ESR actions would be conducted following BLM's ESR Handbook.
- Monitoring actions would be undertaken to determine results from fire management decisions and actions.

2.2.2.1 DWFC and Management Actions by Vegetation Group

The DWFC are ecosystems that are at low risk of losing key ecosystem components following fire. Outside of the WUI, the DWFC is based on the historic conditions (as supported by science and generally agreed upon by BLM resource specialists) with the assumption that those conditions are achievable, sustainable and desirable. Inside the WUI, the DWFC is based on reducing fire risk to communities.

FRCC is a description of vegetation conditions based on the change from natural fire regime and includes effects of fire suppression (fuel loading and encroachment) and invasive species. FRCC I is within its

historical range for fire regime and vegetation attributes. FRCC 2 is moderately altered from its historical range for fire regime and vegetation attributes and FRCC 3 is substantially altered from its historical range and vegetation attributes.

The DWFC is described by major vegetation group in the table below, based on GAP Analysis (Edwards et al. 1998), information in Fire Effects Information System (2004), other publications as noted and input from an interdisciplinary team that included expertise in range ecology, botany, wildlife, fisheries, hydrology and fire ecology. This table also describes actions that are needed and authorized to meet the DWFC. **Table 2.1** specifically addresses actions that result in progress toward achieving DWFC. The actions are described in terms of wildland fire, prescribed fire and non-fire fuel treatments, and post-fire response (including ESR).

Table 2.1 DWFC by Major Vegetation Group and Actions Needed to Meet DWFC

Major Vegetation Group (% in Planning Area)	DWFC and Actions Needed to Meet DWFC
Salt Desert Scrub (29 %)	<p>The DWFC, both outside and inside the WUI, is native, open salt desert scrub vegetation with little to no invasive species cover. Fire would be mostly excluded from these vegetation types. Due to the historical lack of surface fuels, the historical fire return interval is extremely infrequent (FEIS 2004).</p> <ul style="list-style-type: none"> • Due to the historical lack of fire and current potential for cheatgrass invasion, do not allow wildland fire to burn into salt desert scrub vegetation types. Wildland fire is not desired due to high potential for cheatgrass invasion following wildfire and loss of native salt desert scrub communities. • Treat salt desert scrub types using a combination of mechanical, chemical, seeding and biological treatments to reduce cheatgrass cover and restore native communities. Prescribed fire may be used in conjunction with seeding when part of a cheatgrass control objective (Pellant 2002). Due to the high incidence of cheatgrass in this vegetation type, consider seeding following any surface-disturbing activity. • Following wildland fire, aggressively seed to reduce potential for cheatgrass and other noxious weed invasion.
Pinyon and Juniper Woodland (18 %)	<p>Where pinyon and juniper occurred historically, the DWFC both outside and inside the WUI, is open stands of pinyon and juniper with native grass and shrub understory (Miller and Wigand 1994, FEIS 2004). Where pinyon and juniper did not occur historically, the DWFC is the native shrub, grass and forest communities that the pinyon and juniper have invaded. The historical role of fire (estimated 15–50 year fire return interval) prevented encroachment of pinyon and juniper into other vegetation communities (Heyerdahl et al. 2004, Miller and Tausch 2001, Bradley et al. 1992, Romme et al. 2002). Most pinyon and juniper encroachment has occurred in the past 100 years (Miller and Wigand 1994). Follow treatments with seeding in stands that lack native understory vegetation (FEIS 2004). Avoid treatments in old-growth (i.e., pre-settlement stands) pinyon and juniper. Historical occurrence of pinyon and juniper is difficult to map, but pre-settlement trees are generally located in shallow, rocky soils and tend to have a unique growth form characterized by rounded, spreading canopies; large basal branches; large irregular trunks; and furrowed fibrous bark (Miller and Rose 1999). Historic fire return intervals in these protected sites are greater than 100 years (Romme et al. 2002).</p> <ul style="list-style-type: none"> • When possible, allow wildland fire to play its natural role that mimics the historical fire-return interval and severity in stands that have some cover of native understory vegetation. Due to the high risk of losing key ecosystem components in stands with extremely depauperate native understory, avoid wildland fires in these areas. Prescribed fires should be applied to pinyon and juniper communities when native surface fuels will carry fire and when there is low risk of invasive species.

Major Vegetation Group (% in Planning Area)	DWFC and Actions Needed to Meet DWFC
	<ul style="list-style-type: none"> • Prescribed fire should be used to approximate historical fire return intervals and promote recovery of the pre-settlement vegetation cover types. Remove most young (<100 years old) pinyon and juniper trees through fire or mechanical treatments (Brockway et al. 2002). In the WUI, construct fuel breaks between BLM and private land or other values at risk. • Following wildfire in areas lacking native understory, aggressively seed to reduce invasive species establishment and to restore native communities.
Sagebrush (35 %)	<p>The DWFC, both outside and inside the WUI, is healthy sagebrush defined as diverse age classes with an understory of native grasses and forbs (Paige and Ritter 1999). Research suggests that stand-replacement fires burned every 7–110 years depending on the particular sagebrush species and its associated habitat (Miller 2002, Brown 2000, FEIS 2004). Fire management actions in sagebrush must be carefully balanced between invasive species concerns, wildlife habitat and the need to restore fire.</p> <ul style="list-style-type: none"> • When possible, allow fire to play its natural role, which mimics the historical fire-return interval and severity in lands that have a low potential for cheatgrass invasion. Areas with low potential for cheatgrass invasion include higher elevation sites and/or sites that have very low incidence of cheatgrass pre-fire. • Treat dense sagebrush (>30%) (Winward 1991) with fire, mechanical, seeding or chemical treatments to reduce sagebrush canopy cover and improve native grass and forb density and cover; an additional objective in treating sagebrush is to remove encroaching pinyon and juniper trees (Miller and Tausch 2001). In the WUI, construct fuel breaks between BLM and private land (or other values at risk) in dense stands of sagebrush. • Following wildfire in lands lacking native understory vegetation, aggressively seed to promote native understory grasses and forbs and reduce invasion of cheatgrass and noxious weeds. Consider including sagebrush in seeding mixes or planting sagebrush seedlings in high-value wildlife areas following large, high-severity wildfires when natural seed sources would be lacking.
Mountain Shrub (11 %)	<p>The DWFC outside of the WUI is stands with patches of differing age classes. In the WUI, the DWFC is greatly reduced vegetation density or a conversion to less-flammable vegetation, between BLM and private lands or other values at risk.</p> <ul style="list-style-type: none"> • When possible, allow fire to play its natural role, which mimics the historical fire-return interval and severity. • Treat large expanses of even-aged, dense, homogenous stands to result in patches of diverse age classes [see Rondeau (2001) for patch size guidance]. To achieve greater habitat diversity and decreased potential for large-scale high-severity fire, reduce invasion of pinyon and juniper and reduce the average age of stands through fire, mechanical or biological (i.e., grazing goats) treatments. In the WUI, consider aggressive vegetation manipulation to create fire breaks in highly flammable shrub types (e.g., Gambel's oak) when there are values at risk. • Since most of these species sprout following wildfire, consider seeding only to reduce potential for invasive weeds.
Mixed Conifer (5 %)	<p>The DWFC outside the WUI is landscapes with a mosaic of age classes (Arno 2000). In the WUI, the DWFC is reduced canopy density and reduced ladder fuels between BLM and private lands and other values at risk.</p> <ul style="list-style-type: none"> • When possible, allow fire to play its natural role, which mimics the

Major Vegetation Group (% in Planning Area)	DWFC and Actions Needed to Meet DWFC
	<p>historical fire-return interval and severity in stands with low to moderate fuel loading. In dense stands with high fuel loading, consider mechanical treatments prior to re-introducing fire.</p> <ul style="list-style-type: none"> • Treat areas to result in a landscape of diverse age classes while retaining patches of large old trees. In the WUI, remove ladder fuels and create shaded fuel breaks between BLM and private land when values are at risk. • Consider tree planting following wildland fire to restore or rehabilitate the forest resource to promote forest regeneration.
Ponderosa Pine (<1 %)	<p>The DWFC, both outside and in the WUI, is open stands with a native grass and forb understory.</p> <ul style="list-style-type: none"> • When possible, allow fire to play its natural role, which mimics the historical fire-return interval and severity. Restore fire (natural or prescribed fire) to stands with open to moderately-dense canopies and with native understory. • Consider mechanical treatments in dense stands until they reach a lower FRCC before restoring fire. Reduce juniper encroachment through fire (preferred when fuels conditions allow) or mechanical treatments. In the WUI, remove ladder fuels and create fuel breaks between BLM and private land and other values at risk. • Following wildfires, consider seeding to reduce invasive weeds and planting ponderosa pine seedlings for forest restoration and rehabilitation.
Riparian Wetland (<1 %)	<p>The DWFC, both outside and inside the WUI, are riparian and wetland areas with the appropriate composition of native species (e.g., reduction of tamarisk and other invasive species).</p> <ul style="list-style-type: none"> • When possible, allow fire to play its natural role, mimicking the historical fire-return interval and intensity. Allow low to moderate severity fire to burn into riparian and wetland areas when natural ignitions are managed as wildland fire use. • Restore native riparian and wetland species through fire and mechanical treatments. Reduce flammable invasive species along riparian corridors (e.g., tamarisk) through mechanical, chemical, biological and fire treatments. For prescribed fire, allow low intensity fire to back into riparian and wetland areas through ignition outside of these areas. Mechanical treatment as the initial treatment would be emphasized where there is a moderate to high potential for riparian and wetland to be burned to a high severity. • Consider active restoration options when native riparian and wetland communities are unlikely to recover with passive restoration (due to invasive species, stream bank erosion, etc).
Aspen (<1 %)	<p>The DWFC, both outside and inside the WUI, is healthy clones with diverse age classes represented and ample regeneration.</p> <ul style="list-style-type: none"> • When possible, allow fire to play its natural role that mimics the historical fire-return interval and severity since aspen readily sprouts following fire. • Treat aspen stands with fire or mechanical treatments to reduce encroaching junipers and conifers and to stimulate sprouting. If treated aspen stands are small, consider excluding big game and livestock until the regeneration can withstand grazing. In the WUI, consider increasing aspen cover if possible to create a shaded fuel break between private land (and other high value areas) and the more flammable conifer trees on BLM land.

Major Vegetation Group (% in Planning Area)	DWFC and Actions Needed to Meet DWFC
	<ul style="list-style-type: none"> Following wildfire, most aspen stands would need little stabilization, except soil stabilization on steep slopes. However, burned areas may need to be fenced to exclude wildlife and livestock until the regeneration can withstand grazing.

GAP data was developed for use at the statewide and regional level, and has limitations when used at smaller scales. A limitation of using GAP data to describe actual vegetation conditions is that it only maps the existing vegetation, not the reference condition or potential vegetation. Across Utah, major vegetation community type changes have occurred in grasslands, salt desert scrub, sagebrush and pinyon and juniper woodland (FEIS 2004, Kay 2003, Kay 2002). GAP data does not portray these vegetation community changes; it only portrays existing vegetation as a snapshot in time. In order to accurately map FRCC, there must be a detailed knowledge of historical vegetation composition and structure, and disturbance. Unfortunately, that detailed information is lacking across much of the state. It is assumed, due to the prevalence of invasive species, long-term losses of native vegetation, repeat photography, known missed fire return intervals and persistent drought, that most of Utah's BLM lands are characterized as FRCC 2 and FRCC 3. Section 3.3 discusses FRCC in further detail.

One major vegetation group not characterized by GAP vegetation community types is cheatgrass. Although cheatgrass areas in Utah are not mapped, it is accepted that cheatgrass covers large areas of BLM lands in Utah (Menakis et al. 2003). The cheatgrass vegetation type mostly occurs in lower elevations (<6,500 feet). The major vegetation types that have been displaced by cheatgrass are salt desert scrub, sagebrush and grasslands. Where cheatgrass has invaded, the DWFC is to control cheatgrass and take actions to restore the native vegetation community that has been invaded. Fires in cheatgrass-invaded areas or areas with high potential for invasion should be aggressively suppressed and aggressively rehabilitated following wildfire. Wildland fire use would not be appropriate in cheatgrass-invaded sites or in areas with high potential for invasion because of the lack of ability to properly rehabilitate. Costs associated with seeding are not funded by the BLM following wildland fire use.

2.2.3 FIRE MANAGEMENT ACTIONS FOR THE PROPOSED ACTION

Five fire management actions are present in the Proposed Action. The first two, wildland fire suppression and wildland fire use, are considered unplanned and do not undergo site-specific NEPA analysis due to unknown location, size, and timing. The others, (prescribed fire, non-fire fuel treatments, and Emergency Stabilization and Rehabilitation are considered planned actions and undergo site-specific NEPA review and analysis prior to implementation. Immediate actions (e.g., emergencies) surrounding wildland fire suppression are exempt from CEQ's regulatory provisions for implementing NEPA (40 CFR 1506.11). In the event of such emergencies, the BLM must consult with CEQ following direction in H-1790 and DOI Departmental Manual 516 (covering NEPA procedures). Proposed fire management actions are summarized below. **Appendix D** presents fire suppression, wildland fire use, prescribed fire, and non-fire fuel treatments acreage goals and objectives for each FMU.

Wildland Fire Suppression

Fire suppression goals stated in the Proposed Action are designed to protect resource values at risk while allowing wildland fire to function in its ecological role when appropriate for the site and situation, while still protecting resource values at risk. Priorities for aggressive suppression response include providing for public and firefighter safety, preventing wildland fires from spreading to private land, and protecting cultural resources, riparian areas or other sensitive resources and improvements on BLM lands. Minimizing cost must be considered for any type of response. For some FMUs, a suppression objective defines the number of acres of wildfire that must be contained per fire event. Once the pre-defined decadal burn target has been reached

for each vegetative type from unplanned ignitions, a review of objectives and strategies would be initiated to develop new suppression criteria on wildland fires within that FMU. See **Appendix D** for greater detail.

Considerations for suppression objectives with target acres for FMUs are as follows:

- Fire intensity level
- Acreage of public land
- Level of use by the public
- Proximity to private residences, communities, and private inholdings
- Wilderness values
- Historic fire regimes
- Unique biological, cultural, historical, or archeological resources

To meet suppression objectives, appropriate management response (AMR) is applied (BLM 2003b). An AMR is any specific fire suppression action, or combination of actions, suitable to meet FMU objectives (BLM 2003b). The AMR, included as part of the Proposed Action, may include one or more of the following actions:

- *Monitor from a Distance:* Fire situations where inactive fire behavior and low threats require only periodic monitoring.
- *Monitor On-Site:* Fire situations that require the physical placement of monitors on the fire site to track the fire's spread, intensity, and/or characteristics.
- *Confinement:* Actions taken when fires are not likely to have resource benefits, but threats from the fire do not require costly deployment of large numbers of suppression resources.
- *Monitor Plus Contingency:* Fires are managed for resource benefits, but contingency actions are prepared to ensure adequate preparation for possible undesirable developments.
- *Monitor Plus Mitigation:* Fires are managed for resource benefit, yet pose real, but not necessarily immediate, threats. These fires are monitored, but plans are developed and implemented to delay, direct, check fire spread or contain fire, and to ensure public safety.
- *Initial Attack:* Initially, suppress wildland fires if it is consistent with protecting people or resource values at risk.
- *Suppress Large Fires:* A combination of tactics such as direct attack, indirect attack, and confinement by natural barriers are utilized to accomplish protection objectives as directed in a wildland fire situation analysis (WFSA).
- *Control and Extinguish:* Actions are taken when the selected WFSA indicates a control strategy using direct attack. Sufficient resources are assigned to achieve control of the fire minimizing acres burned.

Following wildland fire suppression, areas may undergo emergency stabilization and rehabilitation (ESR) as appropriate. ESR activities may include obliteration of firelines, erosion control, and seeding implemented as an RPM. ESR is only implemented after a wildland fire suppression event. ESR would be designed and implemented using an interdisciplinary team (IDT) approach, utilizing resource and fire staff to develop site-specific ESR plans. The Vernal Field Office completed a *Normal Fire Year Rehabilitation Plan* in 2003 (BLM 2003c) and would follow direction in that document for future site-specific fire rehabilitation projects.

Wildland Fire Use

Management of naturally ignited wildfires to accomplish resource management goals would be determined on an occurrence-by-occurrence basis for each FMU where wildland fire use has been identified for potential use. Consideration of the current fire situation, risks to values, determination of probable fire cause,

availability of resources, and estimation of the potential for fire spread would drive the decision of whether to manage an ignition for wildland fire use or suppress the fire. If a fire was determined to be suitable for management as a wildland fire use incident, the ignition would be managed in accordance with the procedures and requirements outlined in the *Wildland Fire Use Implementation Procedures Reference Guide* (June 2005). See **Appendix D** for greater detail.

Prescribed Fire

Prescribed fire would be implemented to achieve DWFC objectives. Prescribed fire would be considered for an FMU if it could benefit ecosystems and minimize undesirable wildland fire effects through fuels reduction. Suitability of specific areas for introduction of prescribed fires would be determined through a NEPA review prior to implementation.

The prescribed burn season for the Vernal Field Office typically occurs between September 1 and October 30, although prescribed burning during other times is possible. Hand pile burning would usually occur in the winter months (November through February). The fire management staff would initiate prescribed fire projects and burn plans with input from resource specialists. Prescribed burn bosses would be required to evaluate and assess results and effectiveness of the burn. See **Appendix D** for greater detail.

Prescribed fire may be used for any of the following purposes:

- Fuels reduction around federally listed communities-at-risk from wildfire
- Conversion of FRCC 3 lands to FRCC 2 or FRCC 1 lands
- Conversion of FRCC 2 to FRCC 1 lands
- Maintenance of FRCC 1 lands

Non-fire Fuel Treatments

Non-fire fuel treatments (mechanical, biological, seeding and chemical) may be considered as needed by a site-specific plan. For the Vernal Field Office, chemical and biological treatments are relatively uncommon, and would occur on no more than 5,000 acres over ten years. This is much less than 1% of the planning area, therefore impacts from these non-fire fuel treatments won't be analyzed in this FMP EA. Non-fire fuel treatments include hand thinning, hand piling, brush crunching, mowing, disking, and bullhog thinning. Seeding is also often used as a fuel treatment, or in association with fuel treatments. Many FMUs have acreage targets for non-fire fuel treatments. While the remaining FMUs may not have target acreages, future treatment plans would be prepared to implement those actions. Similar to prescribed fire, non-fire fuel treatments are considered planned actions and the suitability of specific areas for their introduction would be determined through a NEPA review prior to implementation.

Non-fire fuel treatments can be used for the same purposes as prescribed fire and may or may not be used in conjunction with prescribed fire. Individual projects would be developed to achieve DWFC and to reduce invasive weed species as stated in the draft Vernal RMP (BLM 2005). Seeding actions often follow wildland fire suppression (these are considered ESR actions, described above), and sometimes follow prescribed fire and non-fire fuel treatments (mechanical, biological, and chemical). Seeding would be implemented to stabilize soils, improve establishment of grass, forb, and shrub communities, and prevent establishment of non-native invasive species. Seeding may be used before or after non-fire fuels reduction treatments for restoration of appropriate vegetation. See **Appendix D** for greater detail.

Resource Protection Measures

The Proposed Action potentially could adversely impact other resources. To prevent such impacts, resource protection measures (RPMs) have been incorporated into the Proposed Action as presented in **Appendix E**.

2.3 NO ACTION ALTERNATIVE

The current Vernal Field Office Fire Management Activity Plan (BLM 1998a) comprises the No Action Alternative. The plan analyzes risks, hazards, and values and includes an operational plan that outlines protection measures for resources. The management measures included in the FMP stress wildland fire prevention planning, suppression and some prescribed fire. **Figure 2.2** illustrates fire management objectives for the No Action Alternative on BLM-administered land.

Although the No Action Alternative has three of the same criteria as the Proposed Action (protection of life, protection of resources, and cost efficiency), it does not provide direction for wildland fire use to restore ecosystems or direction for non-fire fuel treatments as called for by the 2003 National Fire Plan and Healthy Forests Restoration Act. In addition, this existing plan does not incorporate use of the latest scientific information, particularly related to DWFC, FRCC, and rehabilitation and stabilization measures, nor does it include the entire range of resource protection measures as described in the Proposed Action.

The existing FMP allows fire to play a role in the ecosystem on a smaller scale than the Proposed Action. The No Action Alternative recognizes the role of fire in ecosystems, but promotes more aggressive fire suppression and doesn't allow wildland fire use.

The goals, objectives, and target acres for fire management direction in the No Action Alternative are summarized in **Table 2.2**. The No Action Alternative was written in a different format and with different organization of content than the Proposed Action, so direct comparisons are not possible. For example, the No Action Alternative has 23 polygons and analyzes risk assessment; the Proposed Action has 28 FMUs and focuses on DWFC. However, where Vernal planning area-wide elements common to both alternatives are evident (e.g., the role and applicability of wildland fire in consideration of other resources, as well as other fire and non-fire fuel treatment methods), they are compared.

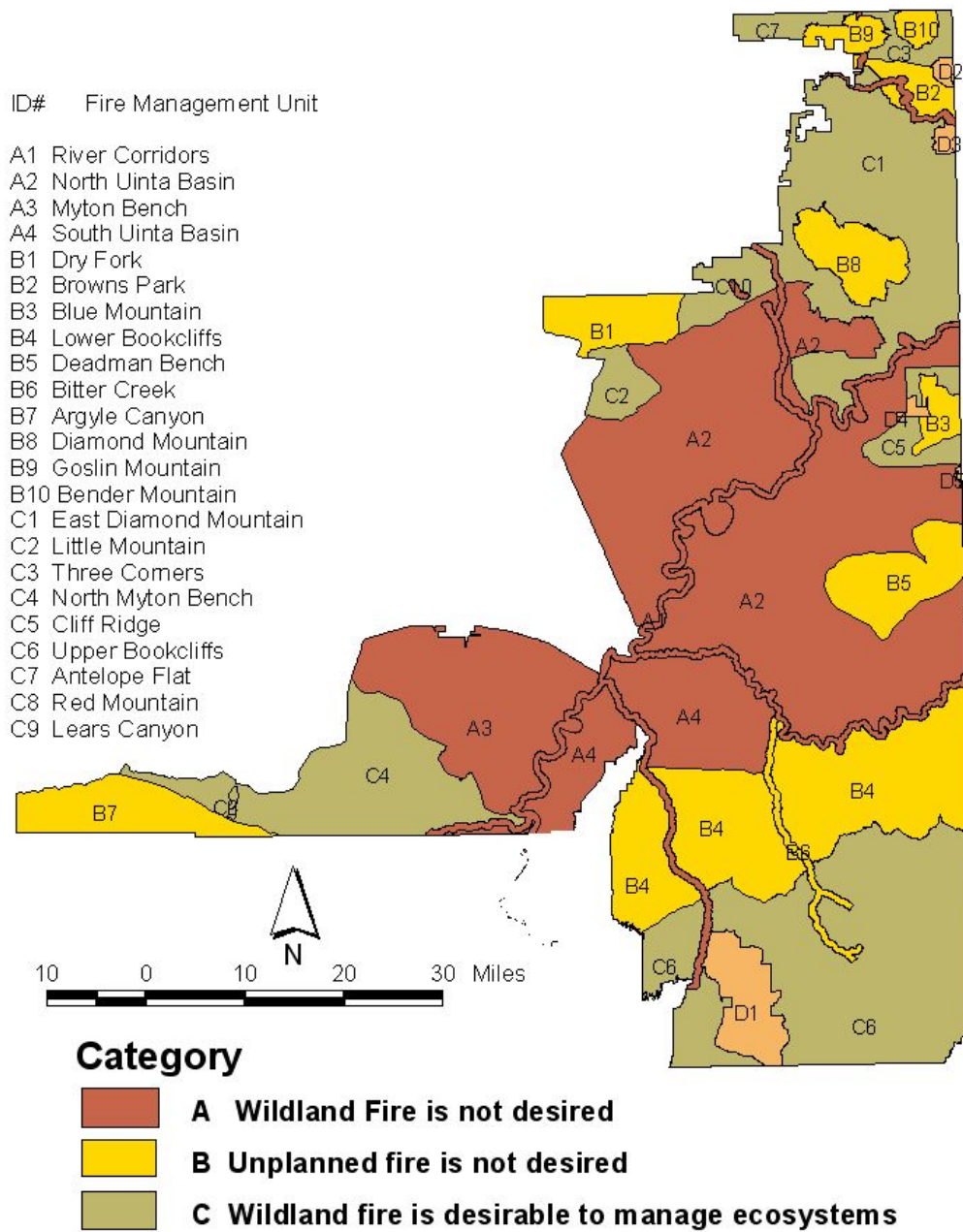
TABLE 2.2: SUMMARY OF THE NO ACTION ALTERNATIVE WITH A COMPARISON TO THE PROPOSED ACTION

	Proposed Action	No Action Alternative
Goals and Objectives Common to Both Alternatives	Firefighter and public safety are the highest priority in every fire management activity. Provide a program that fosters interagency interaction, cooperation, and effectiveness for all fire management activities. Protect high-value resources from fire. Identify appropriate management response goals, objectives, and constraints. Provide a program that fosters interagency interaction, cooperation, and effectiveness for all fire management activities.	
Goals and Objectives	Work collaboratively with communities-at-risk within wildland urban influence to develop plans for risk reduction. Allow fire to function in its ecological role, when appropriate, to help protect, maintain, and enhance public resources. Create an integrated approach to fire and resource management across the landscape and agency boundaries. This approach would be designed to meet the desired outcomes of land use plans.	Focus fire prevention activities, cost efficiently in the priority areas of the field office. Minimize losses by effective implementation of the wildfire prevention plan actions.

	Proposed Action	No Action Alternative																																																
Organization of Alternatives	<p>Planning area is divided into 28 fire management units (FMUs). FMUs are based on management objectives and constraints, topographic features, access, values to be protected, political boundaries, fuel types, fire regime condition class, and other distinguishing characteristics.</p> <p>Each FMU has been divided into one of the following four categories. Approximate amount of total acres in the planning area for each category is indicated in parenthesis.</p> <p>Category A: Fire is not desired. (722,710 acres)</p> <p>Category B: Unplanned fire is not desired, but prescribed fire and/or non-fire fuel treatments may be used to achieve resource objectives. (358,023 acres)</p> <p>Category C: Fire is desired. Constraints are identified on a case-by-case basis, and mitigation efforts are directed toward reducing the impact on values at risk. Prescribed fire and non-fire fuel treatments may also be used to achieve resource objectives. (602,584 acres)</p> <p>Category D: Fire is desired. Unplanned wildfire, planned prescribed fire, and non-fire fuel treatments may be used to achieve desired objectives. (52,929 acres)</p>	<p>Planning area is divided into 14 polygons. Polygons are based on types of activities and uses. Units have specific objectives and suppression constraints.</p> <p>Each polygon has been divided into one of the following four categories. Approximate amount of total acres in the planning area for each category is indicated in parenthesis.</p> <p>Category A: Fire is not desired. (723,291 acres)</p> <p>Category B: Unplanned fire is not desired, but prescribed fire and/or non-fire fuel treatments may be used to achieve resource objectives. (361,319 acres)</p> <p>Category C: Fire is desired. Constraints are identified on a case by case basis, and mitigation efforts are directed toward reducing the impact on values at risk. Prescribed fire and non-fire fuel treatments may also be used to achieve resource objectives. (651,636 acres)</p> <p>Category D: None</p>																																																
Wildland Fire Suppression Contain fire at these acres or less in these vegetation types	<table><tr><th><u>Vegetation Types</u></th><th><u>Acres per incident/per decade</u></th></tr><tr><td>Mountain sagebrush</td><td>575/43,500</td></tr><tr><td>Pinyon and juniper woodland</td><td>2,550/65,400</td></tr><tr><td>Douglas fir-Aspen</td><td>250/8,100</td></tr><tr><td>Mountain browse</td><td>200/20,000</td></tr><tr><td>Cottonwood</td><td>2/100</td></tr><tr><td>Greasewood</td><td>75/1,600</td></tr><tr><td>Willow/herbaceous</td><td>none stated/none stated</td></tr><tr><td>Salt desert shrub</td><td>30/150</td></tr><tr><td>Cheatgrass</td><td>10/50</td></tr><tr><td>Ponderosa</td><td>15/100</td></tr><tr><td>Wyoming big sagebrush</td><td>720/5,350</td></tr><tr><td>Four-wing sagebrush</td><td>25/none stated</td></tr></table>	<u>Vegetation Types</u>	<u>Acres per incident/per decade</u>	Mountain sagebrush	575/43,500	Pinyon and juniper woodland	2,550/65,400	Douglas fir-Aspen	250/8,100	Mountain browse	200/20,000	Cottonwood	2/100	Greasewood	75/1,600	Willow/herbaceous	none stated/none stated	Salt desert shrub	30/150	Cheatgrass	10/50	Ponderosa	15/100	Wyoming big sagebrush	720/5,350	Four-wing sagebrush	25/none stated	<table><tr><th><u>Vegetation Types</u></th><th><u>Acres per incident/per decade</u></th></tr><tr><td>Mountain sagebrush</td><td>1,350/25,600</td></tr><tr><td>Pinyon and juniper woodland</td><td>1,825/50,000</td></tr><tr><td>Douglas fir-Aspen</td><td>250/8,000</td></tr><tr><td>Mountain browse</td><td>200/3,000</td></tr><tr><td>Cottonwood</td><td>2/100</td></tr><tr><td>Greasewood</td><td>50/100</td></tr><tr><td>Willow/herbaceous</td><td>50/none stated</td></tr><tr><td>Salt desert shrub</td><td>10/50</td></tr><tr><td>Cheatgrass</td><td>10/50</td></tr><tr><td>Ponderosa</td><td>none stated/none stated</td></tr></table>	<u>Vegetation Types</u>	<u>Acres per incident/per decade</u>	Mountain sagebrush	1,350/25,600	Pinyon and juniper woodland	1,825/50,000	Douglas fir-Aspen	250/8,000	Mountain browse	200/3,000	Cottonwood	2/100	Greasewood	50/100	Willow/herbaceous	50/none stated	Salt desert shrub	10/50	Cheatgrass	10/50	Ponderosa	none stated/none stated
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	Proposed Action	No Action Alternative
	Non-veg. goals 875/34,000 TOTAL SUPPRESSION ACREAGE PER DECADE: 178,350	Wyoming big sagebrush none stated/none stated Four-wing sagebrush 25/none stated Non-veg. goals none stated/none stated TOTAL SUPPRESSION ACREAGE PER DECADE: 86,900
Wildland Fire Use	As appropriate	No acres stated
Prescribed Fire	146,470 acres (10-year goal)	26,675 acres (unspecified amount of time)
Non-fire Fuel Treatments	53,000 acres (10-year goal)	No acres stated

FIGURE 2.2: FIRE MANAGEMENT CATEGORIES AND POLYGONS FOR THE NO ACTION ALTERNATIVE ON BLM-ADMINISTERED LAND



2.4 ALTERNATIVES CONSIDERED, BUT ELIMINATED FROM FURTHER ANALYSIS

Two additional fire management alternatives—the historical fire alternative and the non-fire treatment alternative—were considered, but eliminated from formal analysis because they either did not meet policy guidelines or they were not ecologically or fiscally practical. The two dismissed alternatives are described below.

2.4.1 HISTORICAL FIRE ALTERNATIVE

The historical fire alternative was considered but eliminated from formal analysis because it would not be ecologically or fiscally feasible. This alternative could be considered the Historical Fire Alternative as it would set treatment targets that mimic acres historically burned while considering the restoration of natural fire regime. These acres were determined from simple vegetation and fire return interval analysis (**Table 2.3**). The primary distinction between this alternative and the Proposed Action are the differences in fuel treatment acreages and differences in treatment types to achieve DWFC; this alternative would include larger treatment acreages than the Proposed Action, and only fire treatments would be employed. The BLM manages scattered parcels of land in many areas; allowing fires to burn in these multiple-ownership areas would increase risk to private and state lands.

The premise on which the development of this alternative was based is that restoration of natural fire regime is desirable and attainable. This premise is faulty in that, as a result of past management and the extent of anthropogenic ecosystem alteration, natural conditions no longer occur in the Vernal planning area. While it is known that there has been significant vegetation alterations associated with historic human use, the extent or the extent or severity of most of these alterations remains uncertain. As a result of ecosystem change, passive restoration techniques, such as restoring naturally occurring fires to the land, would not have the same benefit to ecosystems as in the past. For example, large portions of Utah are affected by the invasion of non-native weedy species. Without active restoration techniques (such as seeding), fires dramatically increase the risk of establishment of invasive species. Establishment of invasive species often results in the permanent loss of historical ecosystem structure and function.

Finally, this alternative is unlikely to be adequately funded. Despite increases in fire management funding over the past five years, current and expected budgets for implementing fire management actions do not provide the necessary resources for accomplishing the identified treatment acres.

Table 2.3: Calculations to Estimate Historic Acreage Burned in Wildfires

Vegetation Type	Fire Return Interval	BLM Acres	Annual Burned Acres
Sagebrush	35	589,094	16,831
Salt Desert Shrub	150	419,521	2,796
Mountain Shrub	50	193,990	3,880
TOTAL		1,202,605	23,507

2.4.2 NON-FIRE TREATMENT ALTERNATIVE

Another alternative considered would have prioritized non-fire fuel treatments above other types of treatments. However, this alternative did not meet the purpose and need of the amendment and was therefore eliminated from further analysis. The Federal Wildland Fire Policy directs that fire be restored as a natural part of the ecosystem.

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter includes a description of the environment and resources with potential to be affected by the alternatives described in Chapter 2 (with additional descriptions found in **Appendices C, D, E and I**). It provides the environmental resource baseline information for comparing potential impacts from the Proposed Action and No Action Alternative, which are analyzed in Chapter 4. Environmental resource information on the general effects not solely attributable to management actions that fire has on each resource is presented in **Appendix H**.

Resources that were identified and carried forward for analysis and those dismissed from further analysis are addressed in **Appendix A**.

3.2 GENERAL SETTING

The Vernal planning area is located within portions of the Rocky Mountain and Colorado Plateau physiographic provinces of the western United States. Elevations in the Vernal planning area range from 4,800 to over 12,200 feet above mean sea level. Most of the Vernal planning area is located between 5,000 to 8,000 feet above sea level.

Climatic zones throughout the region can be classified under two climate types—steppe and undifferentiated highlands. Each has distinct weather patterns, temperatures and precipitation patterns (Pope and Brough 1996). Elevation, topography, location with respect to storm paths over the region and proximity to mountain ranges help create the varied climate types (Garwood 1996). Precipitation varies from an average of less than 10 inches per year to more than 30 inches per year.

The Vernal planning area is comprised of approximately 1.7 million acres of BLM-administered lands. This represents approximately three percent of all lands in Utah and eight percent of BLM-administered land in Utah.

3.3 CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT AND OTHER RESOURCES BROUGHT FORWARD FOR ANALYSIS

3.3.1 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Figure 3.1 identifies the seven ACECs in the Vernal planning area; **Table 3.1** lists the approximate acreage. BLM regulations (43 CFR Part 1610) define an ACEC as an area where “special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources or other natural systems or processes; or to protect life and safety from natural hazards.” Vernal FO RMP Draft EIS (January 2005). The Decision Record for this FMP EA would not be signed, and implementation of the proposed action would not occur until after the RMP Record of Decision is signed.

FIGURE 3.1: AREAS OF CRITICAL ENVIRONMENTAL CONCERN IN THE VERNAL PLANNING AREA

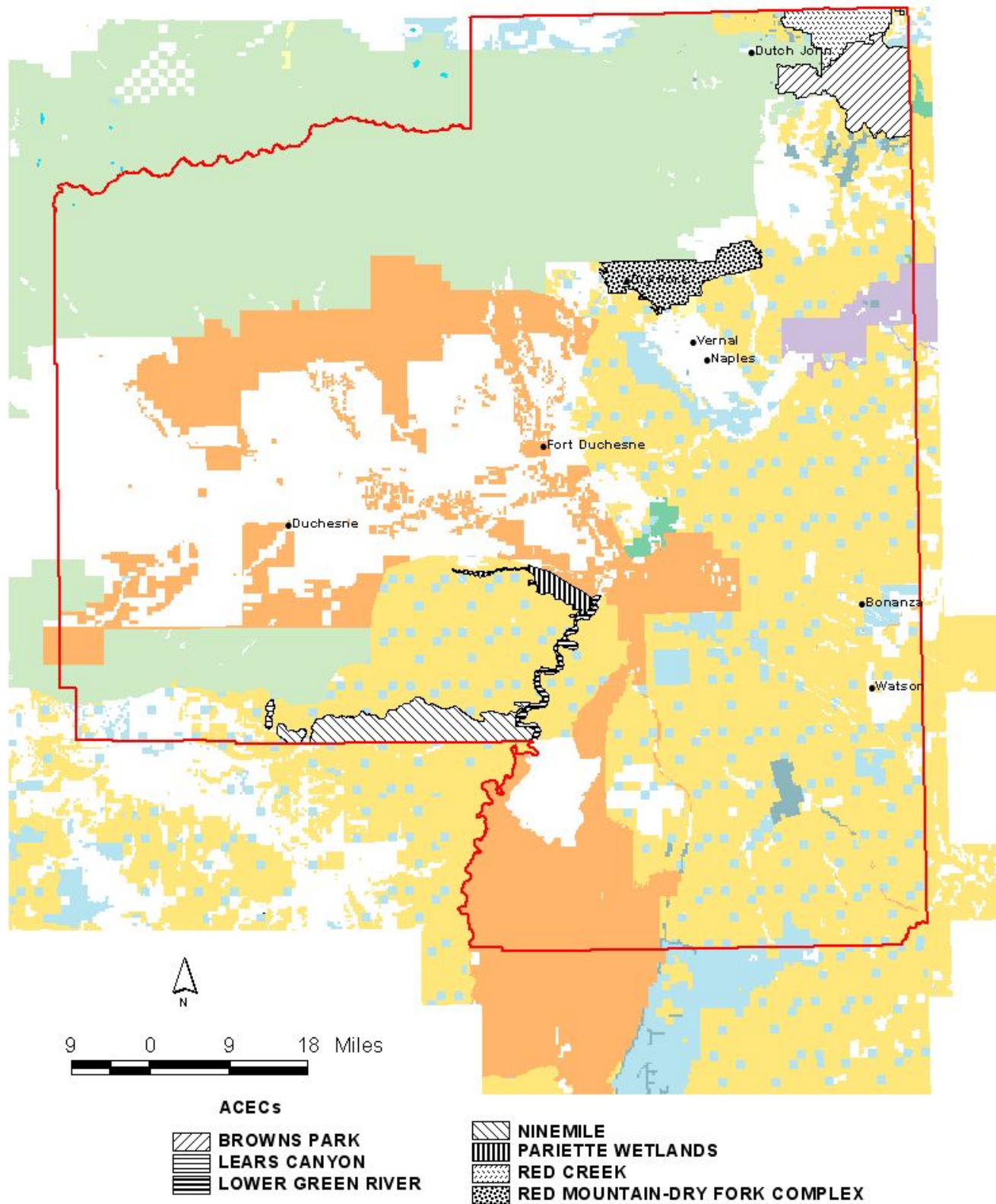


TABLE 3.1: AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Name	Approx. Acreage	Relevant and Important Values
Browns Park	52,721	Endangered Species, Cultural and Historic, Scenic, Riparian
Lears Canyon	1,375	Relict Vegetation
Lower Green River	8,470	Endangered Species, Scenic
Nine Mile Canyon	44,181	Cultural, Endangered Species
Pariette Wetlands	10,437	Unique Biological, Riparian, Endangered Species
Red Creek	24,475	Erosion, Watershed
Red Mountain-Dry Fork Complex	24,285	Cultural and Paleontological, Relict Vegetation
TOTAL ACREAGE	165,944	

3.3.2 CULTURAL RESOURCES

Cultural resources include archaeological, historic (older than 50 years of age), prehistoric and architectural sites where human habitation or use has occurred, and that are significant for scientific research or public preservation and interpretation. These resources include Traditional Cultural Properties (TCPs) and religious sites that are important to Native American and other cultural groups. A number of legislative acts and EOs provide procedures and guidelines for federal agencies that determine affects of their projects on cultural resources, including, but not limited to, NHPA, as amended; American Religious Freedom Act; Archaeological Resources Protection Act; and EO 13007 (Indian Sacred Sites).

Section 106 of NHPA and its implementing regulations (36 CFR 800) require federal agencies to take into account the effects of their undertakings on historic properties. According to these regulations, a historic property is defined as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places...”, 36 CFR 800.14. This definition also encompasses artifacts, records, and remains related to such properties. Compliance with Section 106 of NHPA would be completed on a project-specific basis before planned actions are implemented.

Identification and context for cultural resources are included in the LUP referenced at the beginning of this section, and are incorporated herein by reference. The following updates the discussions and provides a general overview of the wide range of prehistoric and historic sites that occur on BLM-managed land throughout Utah.

The diverse physiography and ecosystems found in this area is reflected in the diverse prehistoric cultural history of the region, which includes cultural influences from the northern Colorado Plateau, Eastern Great Basin, and the northern Plains. Within the lands administered by the Vernal planning area, one may encounter a significant and varied record of human adaptation represented by cultural resources that include prehistoric and historic archaeological sites and landscapes. These cultural resources should be viewed as non-renewable resources that represent a significant record of human adaptation of both prehistoric and historic cultures that have been and continue to be of interest and importance to a wide spectrum of people.

Various explorers, scholars, government institutions, and private cultural resource-consulting firms have carried out anthropological and archaeological investigation within the Uinta Basin and the surrounding regions (1826 to present). The quality and quantity of research carried out by these different entities, has, to date, proven to be highly variable. Previous research projects have ranged from small surveys of a limited geographical area, to large linear projects spanning the entire Uinta Basin.

While there are numerous inventories of cultural resources in the Vernal planning area, there are data gaps in the database that have increased the overall difficulty in the management of these resources. These limitations include large areas that lack cultural resource inventory, gaps in the database pertaining to particular sites types, and research related data limitations. Despite the many cultural resource inventories that have been conducted on the Vernal planning area, the total percentage of the area that has been inventoried is relatively small (cursory review suggest that less than 20 percent of the Vernal planning area has been subject to intensive cultural resource inventory). As a consequence, there are still large areas for which there is no current information regarding the numbers, types, and distribution of cultural resources.

Approximately 5,000 cultural resource sites have been documented within the Vernal planning area. Prehistoric cultural resource sites are generally defined as those composed of or containing features and/or artifacts that are affiliated with cultural groups who occupied the area prior to 1800. Historic cultural resource sites are defined as those composed of or containing features and/or artifacts that post-date 1800 but are at least 50 years old. To be considered a site, either prehistoric or historic, a site must specifically contain the remains of past human activity that are at least 50 years old and should consist of one or more of the following:

- At least 10 artifacts of a single class (e.g., 10 sherds) within a 10-meter diameter area, except when all pieces appear to originate from a single source (e.g., one ceramic pot, one glass bottle);
- At least 15 artifacts which include at least two classes of artifacts (e.g., sherds, nails, glass) within a 100-meter diameter area;
- One or more archaeological features in temporal association with any number of artifacts; or
- Two or more temporally associated archaeological features without artifacts.

Isolated cultural material (artifacts or features) are defined as those with fewer than 10 artifacts within a 10-meter diameter area or greater than 10 artifacts within the same area if all artifacts appear to originate from a single source, and/or one archaeological feature without associated artifacts.

There are three ACECs in the Vernal planning area that include cultural resources as a preservation intent or value. These are the Brown's Park ACEC Complex (B2), Nine Mile Canyon (C4), and Red Mountain Dry Fork ACEC Complex (C8 and B1). The Brown's Park Complex encompasses 55,700 acres and includes the John Jarvie National Historic District. The historic wooden homes in this historic district have a high risk from fire effects. Sites at risk from fire effects in the Nine Mile Canyon ACEC (50,600 acres) include prehistoric habitation sites, lithic scatters, food storage sites, and rock art. The third ACEC in the Vernal planning area that concerns cultural resources is the Red Mountain Dry Fork ACEC Complex (25,800 acres). Cultural resources in this ACEC include a very high density and high-risk set of prehistoric archaeological sites.

There are five historic properties listed on National Register of Historic Places (NRHP) in the Vernal planning area. These listings include the John Jarvie National Historic District located in Brown's Park, Cocklebur Wash Petroglyphs near Jensen, Little Brush Creek Petroglyph Panel near Vernal, McConkie Ranch Petroglyphs near Dry Fork, Dr. John Parson Cabin Complex in Brown's Park, and the east portion of Nine Mile Canyon.

Prehistoric Resources

Thousands of archaeological sites representing more than 8,000 years of human occupation have been recorded on BLM-managed land in the Vernal planning area. The primary known prehistoric cultural resource site types include rock art, burials, open camps and villages, platform sites, rock shelters and caves, architectural sites, artifact scatters, resource procurement sites, ceremonial sites, isolated features, trails, and landscapes. This list represents broad categories of both common and less common cultural resource sites

know to be in the Vernal planning area. The majority of the prehistoric sites tend to concentrate near seeps and springs in mountain ranges and along perennial streams, such as Dry Fork, Ashley Creek, Spring Creek, Bitter Creek, and Upper Willow Creek drainages. River corridors are also known to have high cultural resource site densities and often include sites deemed to be at high risk from fire effects. For example, the Green, White, and Whiterocks River corridors and Brush Creek and Willow Creek drainages are known to contain high densities of cultural resource sites. Other areas are in the North Uinta area, especially in the upland/bench areas adjacent to the White and Green Rivers. The Upper Bookcliffs and the Myton Bench areas, as well Nine Mile Canyon and Five Mile Canyon, contain high densities of cultural resource sites.

Historic Resources

Historic resources in the Vernal planning area pertain primarily to Spanish, Mexican, and Euro-American activities since 1776. They include ghost towns, historic ranches, and numerous historic trails and wagon trails. Some historic trails, such as the 1776 Dominguez and Escalante Trail and the Old Spanish Trail, date to the period of Spanish/Mexican exploration. Resources pertaining to mining and Euro-American settlement date from 1867, and numerous “ghost towns” (i.e., abandoned settlements) occur throughout the region. Many resources, such as the National Register-listed the John Jarvie Historic District in Brown’s Park, are considered historically significant and are accessible to the public. Roads and structures constructed by the Civilian Conservation Corps are also present. The primary known historic cultural resource site types known to be located in the Vernal planning area include historic inscriptions (including “Aspen-glyphs” and those inscribed on ponderosa pines), burials/cemeteries, camps, architectural sites, artifact scatters, irrigation systems/canals, mining sites, oil and gas industry sites, transportation sites, and landscapes.

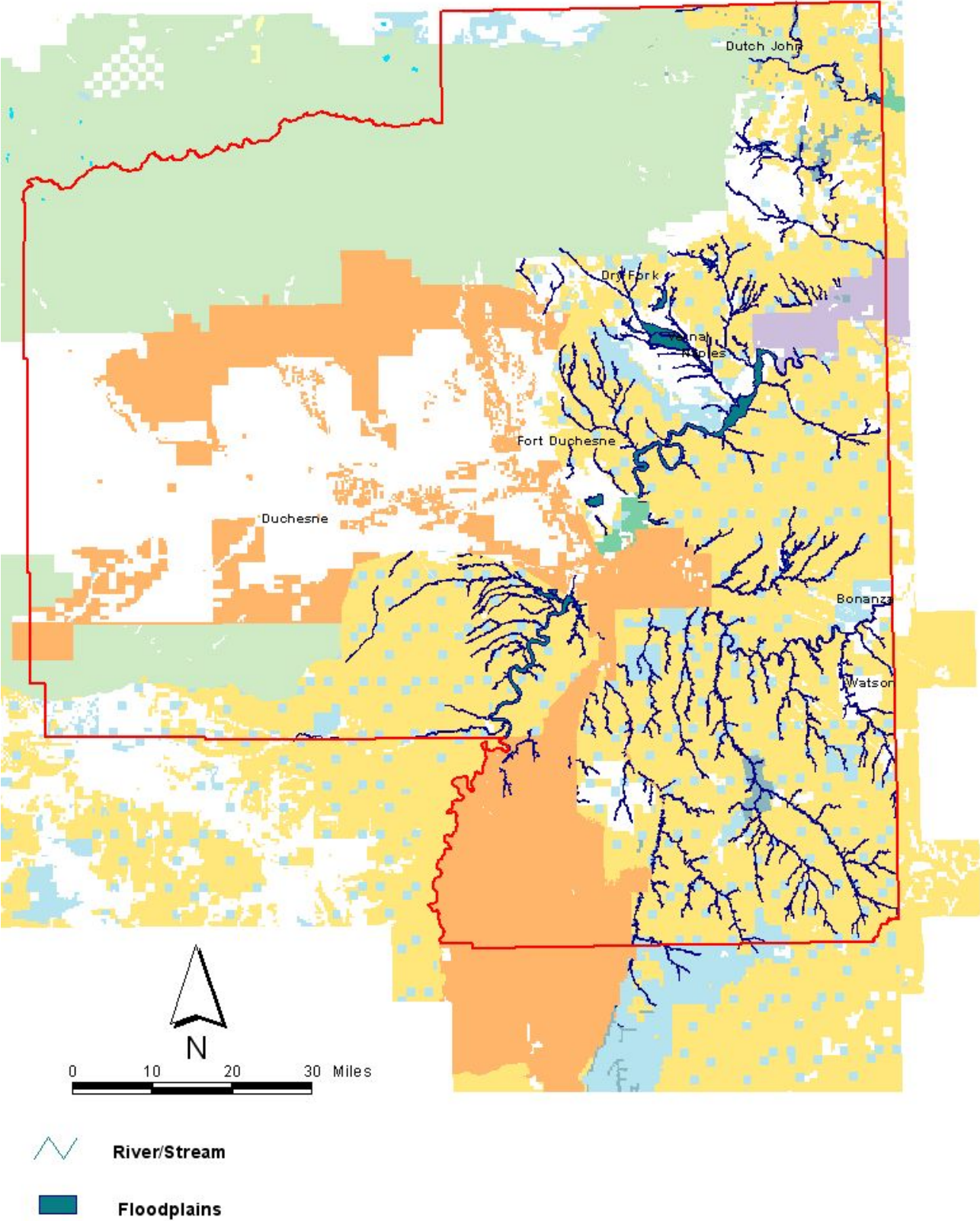
3.3.3 FLOODPLAINS

Floodplains are defined as the relatively flat portion of a river valley, adjacent to the river channel, which is comprised primarily of sediments deposited by the river during high-flow (flood stage) events. Floodplains play an important role in basin hydrology and ecosystem health. Floodplain geomorphology exerts influence of stream peak flow lag time (time between peak precipitation and peak runoff) and serves as temporary storage for sediment eroded from the watershed (Ritter et al. 1995). Floodplains are also often associated with wetlands and riparian areas (discussed in the wetlands and riparian zones section of this chapter).

The recurrence of various flood stages (river elevations) are defined as 10-year, 100-year, and 500-year floods where, for example, a 100-year flood has a one percent statistical chance of occurring in any given year. The National Flood Insurance Program, overseen by the Federal Emergency Management Agency, has mapped 100-year floodplain areas throughout the country, including Uintah County, located in the Vernal planning area. Vernal Field Office personnel have also mapped 100-year floodplain areas in Daggett and Duchesne Counties. **Figure 3.2** presents a map of the Vernal planning area with rivers, streams, and associated 100-year floodplains identified with the Vernal planning area FMUs.

On May 24, 1977, EO 11988 was issued to reduce “adverse impacts associated with the occupancy and modification of floodplains” and “direct or indirect support of floodplain development” associated with federal actions (42 FR 26971, 3 CFR, 1977). Requirements of EO 11988 include reducing the risk of flood loss; minimizing the impact of floods on human safety, health and welfare; and restoring and preserving the natural and beneficial values served by floodplains. The EO also requires consideration of alternatives to avoid diverse effects and incompatible development in floodplains. Federal actions proposed in floodplains areas must conform to EO 11988.

FIGURE 3.2: 100-YEAR FLOODPLAINS IN THE VERNAL PLANNING AREA



3.3.4 INVASIVE, NON-NATIVE SPECIES

Invasive and non-native species, sometimes referred to as weeds, are an increasing problem on BLM-administered lands. These plants were introduced either accidentally (such as cheatgrass in contaminated crop seed or livestock forage) or intentionally (such as tamarisk for wind-breaks and streambank stabilization). They may readily establish in highly disturbed areas, particularly burned areas. The spread of invasive non-native species poses a hazard to vegetation communities on BLM rangelands because they are aggressive, broadly adaptive, and lack the natural predators found in their native habitat. They can also displace native plants as they compete for space, sunlight, water, and nutrients and can cause drastic changes in the composition, structure, and productivity of vegetation communities.

Cheatgrass

In the Vernal planning area, cheatgrass is the primary management issue in the salt desert shrub, sagebrush, pinyon and juniper woodland types, and in the riparian vegetation type (along with tamarisk). Non-native invasives such as cheatgrass can alter fire regimes and cause fire re-occurrence to increase when they out-compete more fire-resistant native vegetation. They also provide flammable fuels between the interspaces among shrubs that allow fire to carry in an unnatural manner (McAuliffe 1995; Brown 2000).

Introduced from Eurasia in the late 1800s, cheatgrass is an opportunistic winter annual that filled the void left vacant by the reduction of herbaceous vegetation by livestock grazing at the turn of the century (Pellant 2002). It germinates between autumn and spring when temperatures and soil moisture are suitable. Cheatgrass, as a winter annual, can begin growth in early spring and does not have to wait for temperatures to warm. Other reasons for its success are that its seed never goes dormant; it produces a large number of seeds per plant that remain viable for five years; and because of its long awns, it is fairly resistant to grazing. Cheatgrass may be present in relatively undisturbed plant communities, but usually becomes dominant on disturbed sites (Fielding and Brusven 2000). Although it does occur, cheatgrass has been less successful in dominating sites that are above 7,000 feet because there is more soil moisture available to native perennial grasses.

The process of shrub loss and conversion to annual grasslands is a key management problem that affects nearly every use of public rangelands. The lack of shrub cover makes for poor-quality wildlife habitat, so annual grasslands have diminished plant and animal diversity. Cheatgrass is also inferior livestock forage.

The criteria for establishing when cheatgrass becomes an invasive concern or a fire concern are not readily assigned. Limbach (2002) suggests five percent cover as an invasive concern and 15 to 20 percent cover as a fire/fuels concern (both percentages relative to associated understory species). Degraded sites are most susceptible to annual grass invasion after fire. An abundance of cheatgrass in the understory enhances the likelihood of fire spread and conversion of sagebrush steppe or salt desert shrub to annual grassland (Howard 1999).

Tamarisk

Tamarisk has become well-established along river and stream channels in WUI zones and represents a serious fire hazard that puts the resources at risk of high-heat, rapid-spread fire. It out-competes many native species and, because of its extensive root system, is difficult to eradicate once established. This species invades senescent cottonwood riparian sites that have dried out as a result of infrequent flooding. Tamarisk has been listed as a noxious weed in Uintah County.

Knapweed

There are several species of knapweed (*Centaurea spp*), however the four that are a problem in Utah are squarrose knapweed (*C. squarrosa*), Russian knapweed (*C. repens*), diffuse knapweed (*C. diffusa*), and spotted knapweed (*C. maculosa*). On the Vernal District, it is primarily Russian knapweed. All four are classified as shade-intolerant and readily establish in burned areas that have been opened up to sunlight. All produce prolific seed and spread rapidly; squarrose knapweed was detected in Utah in 1954 and is now estimated to infest 140,000 acres in 1996 (BLM 1998b). There is evidence that some (if not all) have alleopathic characteristics, i.e., they release chemicals that inhibit the growth of surrounding vegetation (Whitson et al. 1991), reducing competition and flammability of the site. This results in an altered soil chemistry, which may further exacerbate the problem of returning native species to the site. All four are listed as official noxious weeds of Utah, with the sap of spotted and Russian knapweeds known to be carcinogenic to humans.

Like cheatgrass, it is expected that knapweed populations would continue to increase and that desirable native communities would decrease due to disturbance; e.g., knapweed can spread by off-road travel with an estimated 2,000 seeds sticking to one wheel if run over. Because they are found in the 8- to 12-inch precipitation zone, this infestation would likely occur in the grassland, sagebrush, and pinyon and juniper woodland zones.

Musk Thistle

Musk thistle is spreading into sagebrush and pinyon and juniper woodland types. Following fire, musk thistle produce abundant seed. Fire creates conditions that are favorable to the establishment of musk thistle (i.e. open canopy, reduced competition, areas of bare soil), making it likely to spread if seeds are present.

Houndstongue

In Utah, houndstongue may be found in sagebrush, pinyon and juniper woodland, cottonwood, mountain shrub, aspen, and ponderosa pine communities. Fire creates conditions that are favorable for establishment of houndstongue (i.e. open canopy, reduced competition, areas of bare soil), so if houndstongue seeds are present and competition minimal, it may be favored in the postfire community. Houndstongue plants may also survive fire, since nutrient reserves in the taproot acquired during the 1st year are sufficient for normal seed production the following year, even if the plants are completely defoliated early in the spring.

Black Henbane

Black henbane is toxic to humans and animals when ingested. Plants sprout when the seed are exposed to sunlight and is mostly found in disturbed areas. Like most invasive, non-natives, fire creates favorable conditions for the proliferation and spread of this plant.

3.3.5 NATIVE AMERICAN RELIGIOUS CONCERNS

The Utah BLM is in the process of consulting with 23 tribal groups who have expressed an interest in places of traditional religious or cultural importance located on all or part of BLM lands within the State of Utah, including the Vernal planning area. This consultation is being carried out to provide an opportunity for tribes to identify any places of traditional religious or cultural importance relevant to the proposed FMP amendment. Many Native American belief systems require that the identity and location of traditional religious and cultural properties not be divulged. BLM has a commitment to keep specific information regarding such resources confidential to the fullest extent allowed by law.

Within the context of NHPA, a traditional cultural property (TCP) is a property that may be eligible for inclusion on the NRHP due to its association with the cultural practices or beliefs of a living community. It

should be noted that eligibility is also dependent upon these practices or beliefs having been passed down through the generations and that they are important in maintaining the cultural identity and integrity of that group. Native American TCPs frequently have religious significance, and they are not usually recognizable to an outsider through archeological or historical investigations. The existence and locations of TCPs may often only be identified through consultation with members of the groups who ascribe value to those places. Hunting or gathering plants for food or medicinal use may be a value ascribed to these locations.

3.3.6 SPECIAL STATUS SPECIES

The special status plant and animal species analysis has been broken out into two parts: ESA-related species and BLM sensitive species.

ESA-related species include those listed as endangered and threatened under the ESA of 1973, as amended, some of which have designated or proposed critical habitat, as well as candidate species (**Appendix F**). Threatened and endangered species are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS). Candidate species are not under the jurisdiction of the USFWS; however because they are given recognition as candidates for federal listing on the ESA, they are discussed under the ESA-related heading.

BLM sensitive species include BLM sensitive plant species, some of which may be managed through conservation agreements in which BLM participates (**Appendix G**).

ESA-Related Species

Seven endangered, six threatened, and four candidate (one of which has been petitioned for listing) species are known to occur on or adjacent to the Vernal planning area. These 17 federally listed species can be grouped as follows: eight plants, three birds, two mammals, and four fishes. These species are listed in **Appendix F**, along with their scientific name, federal status, associated vegetation community/habitat type, and field office(s) having jurisdiction over potentially suitable habitat.

Five of the 17 federally protected species (one bird and four fish species) have designated critical habitat on BLM-administered lands in Utah. These designations and this proposal are presented in **Table 3.2**.

TABLE 3.2: FEDERALLY LISTED SPECIES AND THEIR DESIGNATED CRITICAL HABITAT

Species	Critical Habitat	General Location
Mexican spotted owl	Designated	Southern and eastern Utah in nine counties
Humpback chub	Designated	Eastern Utah in seven counties
Bonytail	Designated	Eastern Utah
Colorado pikeminnow	Designated	Eastern Utah in seven counties
Razorback sucker	Designated	Eastern Utah

It should be noted that the black-footed ferret, although considered to be extirpated from much of the state, is found within the Vernal planning area. An experimental, non-essential population [ESA, Section 10(j)] of the ferret has been established with a designated use area comprised of two counties (Duchesne and Uintah) within the Vernal planning area. BLM management authorities consider the ferret to have a status within the designated use area that is equivalent to the federal listing status of “proposed.” If individual ferrets were to venture outside of the designated use area, they would be considered endangered and the appropriate management regulations would apply.

BLM Sensitive Species

Thirteen wildlife species of concern, 11 sensitive plant species, and five conservation agreement species are known to occur on or adjacent to the Vernal planning area. These 29 BLM sensitive species can be grouped as follows: 11 flowering plants, 11 birds, 2 mammals, 4 fish, and 1 reptile. These species are listed in **Appendix G**, along with their scientific name, federal status, associated vegetation community/habitat type, and field office(s) having jurisdiction over potentially suitable habitat.

Species Habitat

Habitats associated with each SSS and their distribution are widely variable. Some species are found throughout the Vernal planning area while others are endemic to a single location. As noted above, Utah Gap Analysis Program (GAP) was used to identify cover types pertaining to this project. GAP provides an indicator of vegetation coverage and habitat types at the large scale, but is not particularly accurate on the ground for site-specific projects. Consequently, it is possible that the expanse (acreage or boundary) of a cover type could be inaccurate, and that cover types, and species associated with these cover types, may not actually be present at the project-specific level.

Cover types identified include salt desert shrub, pinyon and juniper woodland, sagebrush, mountain shrub (also called mountain browse), mixed conifer, ponderosa pine, riparian and wetland (also called riparian), and aspen. These vegetation cover types and their prevalence on BLM-administered lands throughout the Vernal planning area are identified in Section 3.3.13 (Vegetation). The remaining vegetation type within the Vernal planning area is grassland. Because it is not comprised of burnable vegetation, the water cover type was not previously listed. However, because water is a valuable habitat and has the potential to be impacted by the proposed project, it is included in this section and the Fisheries and Wildlife section, as a habitat type.

The following is a list of SSS (split into ESA-related and BLM sensitive species) generally associated with each of the 10 vegetation communities/habitat types. It should be noted that special status plant species are not necessarily associated with vegetation community types but are more closely associated with substrate type. Therefore, plant species listed in the vegetation community associations below do not infer an actual association, but rather indicate the vegetation community surrounding each plant species. **Appendix F** and **Appendix G** present associated substrates for each plant species.

Salt Desert Shrub

ESA-related: Shrubby reed-mustard, clay reed-mustard, Uinta Basin hookless cactus, horseshoe milk-vetch, Graham's beardtongue, White River beardtongue.

BLM Sensitive: Park rockcress, Hamilton milk-vetch, Flowers penstemon, Gibbens penstemon, Goodrich penstemon, mountain plover.

Pinyon and Juniper Woodland

ESA-related: Barneby ridge-cress, shrubby reed-mustard, Graham's beardtongue, White River beardtongue, Mexican spotted owl.

BLM Sensitive: Park rockcress, Hamilton milk-vetch, Ownbey thistle, Untermann daisy, rock hymenoxys, stemless penstemon, Gibbens penstemon, Goodrich penstemon, Lewis's woodpecker.

Sagebrush

ESA-related: Horseshoe milk-vetch, bald eagle, Mexican spotted owl, black-footed ferret.

BLM Sensitive: Ownbey thistle, Untermann daisy, Huber's pepperweed, stemless penstemon, ferruginous hawk, greater sage grouse, mountain plover, white-tailed prairie dog, smooth greensnake.

Grassland

ESA-related: Black-footed ferret.

BLM Sensitive: Grasshopper sparrow, burrowing owl, ferruginous hawk, long-billed curlew, mountain plover.

Mountain Shrub

ESA-related: Shrubby reed-mustard.

BLM Sensitive: Untermann daisy, rock hymenoxys, Huber's pepperweed, Lewis's woodpecker, Townsend's big-eared bat.

Mixed Conifer

ESA-related: Bald eagle, Canada lynx.

BLM Sensitive: Untermann daisy, Huber's pepperweed, northern goshawk, Lewis's woodpecker, three-toed woodpecker, Townsend's big-eared bat.

Ponderosa Pine

ESA-related: None.

BLM Sensitive: Rock hymenoxys, Huber's pepperweed, Lewis's woodpecker.

Riparian/Wetland

ESA-related: Ute ladies'-tresses, bald eagle, Mexican spotted owl, western yellow-billed cuckoo.

BLM Sensitive: Ownbey thistle, Alcove bog-orchid, northern goshawk, bobolink, Lewis's woodpecker, American white pelican, smooth greensnake.

Aspen

ESA-related: None.

BLM Sensitive: Three-toed woodpecker.

Water

ESA-related: Humpback chub, bonytail, Colorado pikeminnow, razorback sucker.

BLM Sensitive: Colorado River cutthroat trout, roundtail chub, bluehead sucker, flannelmouth sucker.

3.3.7 WATER QUALITY

Surface Water

Watersheds, aquifers, rivers and stream are ecologically dynamic interfaces of atmosphere, soils, and water. Healthy watersheds capture precipitation and runoff, store water in the soil (or bedrock) profile, and release it slowly back into the landscape surface waters. Most of the water supply to these watersheds comes from snowmelt during the spring and early summer months and precipitation from high-intensity convective storms throughout the spring, summer, and fall. There are also many ephemeral drainages throughout the watershed that flow intermittently during the year.

The major watershed management unit identified in the Vernal planning area is the Uinta Basin Unit (UDEQ 2005a). Major river and watersheds systems located in the Vernal planning area include the Green, Uinta, Strawberry, Duchesne, and White Rivers. Surface water within the planning area is used for domestic,

recreational, aesthetic, agricultural, stock-watering, and industrial purposes. They also are habitat for aquatic and water-oriented wildlife and fish.

The Federal Water Pollution Control Act of 1972 and CWA of 1977 and subsequent amendments/revisions are the predominant federal legislations that direct management of water quality on BLM-administered lands. CWA mandates restoration and/or maintenance of the chemical, physical, and biological integrity of our nation's waters, while Section 303 primarily dictates further compliance to state and local water quality standards. BLM must also comply with Utah Department of Environmental Quality (UDEQ) water quality standards.

Under Section 303(d) of CWA, UDEQ is directed to list all waters that do not meet water quality standards or have impaired beneficial uses (e.g., drinking water, recreation, etc.). Waterbodies in which water quality is impaired are referred to as “303(d)-listed streams” or “impaired waters.” The sources of these impairments come predominantly from agriculture (e.g., grazing, irrigation); natural sources (e.g., bedrock); on-the-ground hydrological modification (e.g., resource extraction and road construction); and point-source discharges. When a stream is listed as impaired, the allowable total maximum daily load (TMDL) of a pollutant, such total dissolved solids, is required to be calculated for the stream. TMDLs apply to both point and non-point sources. The UDEQ is in the process of developing TMDLs for various waterbodies throughout Utah.

Ten waterbodies within the Vernal planning area have been identified by the UDEQ Division of Water Quality as 303(d)-listed streams (UDEQ 2004), totaling approximately 346 miles of streams, rivers, reservoirs, or lakes. **Figure 3.3** presents the locations of 303(d)-listed streams identified within the Vernal planning area. TMDLs have been completed for 303(d)-listed sections of the Ashley Creek (pending), Browne Lake, and the Uinta River watershed (UDEQ 2005b).

Several watersheds in the Vernal planning area also contain protected surface water sources used for municipal water supply. The Ashley Spring (stream) source supplies drinking water for the Ashley Valley Water District and Central Utah Water Conservancy District. Red Fleet Reservoir and Starvation Reservoir also supply water for Central Utah Water Conservancy District. Flaming Gorge Reservoir supplies water for the town of Dutch John. The Upper Buck source supplies water to the Greendale Water Company. The Whiterock River supplies water to Tridell Lapoint Water District (Johnson 2005). These surface water supply sources are particularly vulnerable to changes in upstream water quality.

The Edith Aspen Spring located northeast of Dutch John supplies drinking water to the Questar Gas Clay Basin camp and is a protected source area. The effects of fire, however, are not likely to impact spring water sources due to the protected (underground) nature of the water.

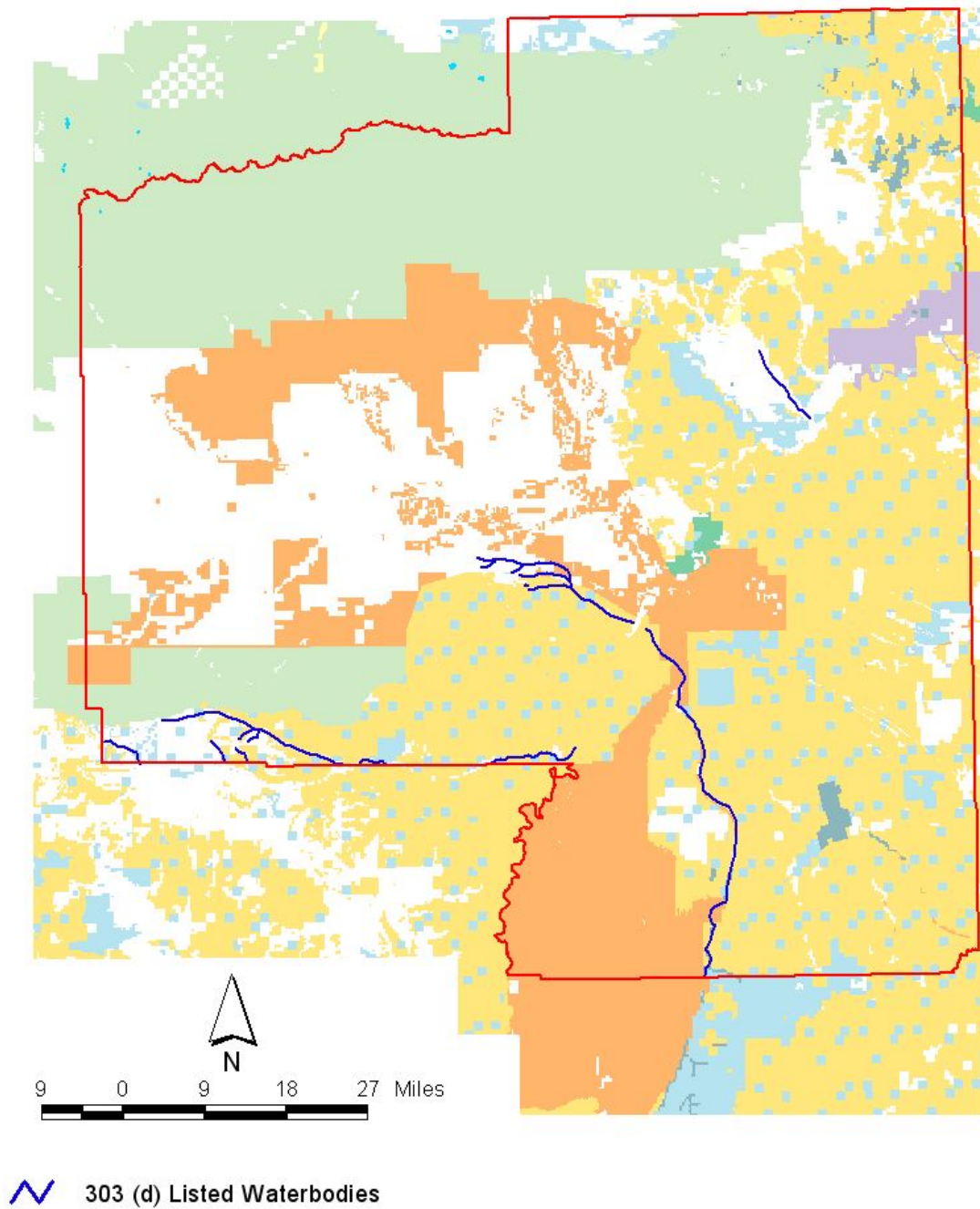
As discussed in the introduction to this chapter, the Red Creek watershed located in the Green River drainage has been designated as an ACEC (BLM 2005). This area is a regionally significant critical watershed and has Class I fisheries values.

Groundwater

Primary recharge areas generally occur along mountain fronts where basin-fill materials erode from mountain bedrock (Baskin et al. 2002). Groundwater accumulates in these areas and flows downgradient. Further away from the mountain fronts, groundwater discharge areas occur where groundwater collects (e.g., to form playas) or flows to surface waterbodies.

Groundwater recharge areas could be particularly vulnerable to surface sources of pollution because groundwater movement is typically pulled downward by gravity and primary recharge areas may not have protective, fine-grained layers (such as typically found in basin valleys) that serve to filter out the pollutants. In addition, groundwater could be sensitive to total dissolved solids in aquifer media (soil or bedrock) types.

FIGURE 3.3: 303(D)-LISTED WATERBODIES IN THE VERNAL PLANNING AREA



Groundwater is part of the developed water supply for numerous municipalities in the Vernal planning area and supplies private water wells used for drinking water and irrigation. The location of water wells and underground water diversion rights can be obtained from the Utah Division of Water Rights at <http://www.waterrights.utah.gov>.

3.3.8 WETLANDS AND RIPARIAN ZONES

A riparian area is generally defined as the area alongside perennial or ephemeral stream that is influenced by the presence of shallow groundwater. The U.S. Army Corps of Engineers (Federal Register 1982) and Environmental Protection Agency (EPA) (Federal Register 1980) jointly define wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and which, under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. BLM Manual 1737 (BLM 1992), *Wetlands and Riparian Area Management*, includes marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas as wetlands.

Riparian and aquatic areas comprise only a small portion of the lands managed by the BLM; however, their ecological significance is far greater than their limited physical scope as these systems form some of the most dynamic and ecologically rich portions of the landscape (Elmore and Beschta 1987).

Wetlands and riparian areas play a significant role in restoring and maintaining the chemical, physical, and biological integrity of the nation's water. Wildlife use wetlands and riparian areas disproportionately more than any other type of habitat. In addition, wetlands and riparian areas are highly prized for their economic values and other uses such as livestock production and recreation (BLM 1994). Under natural conditions, riparian and aquatic ecosystems have a high degree of structural complexity, reflective of past disturbances such as floods, fire, ice floes, wind storms, grazing, disease, and insect outbreaks (Gregory et al. 1991).

If a wetlands and riparian area is not in properly functioning condition PFC, it is placed into one of three categories:

- *Functional-at-Risk*: Wetlands and riparian areas that are in functional condition but have an existing soil, water, or vegetation attribute that makes them susceptible to degradation.
- *Non-functional*: Wetlands and riparian areas that clearly are not providing adequate vegetation, landform, or woody debris to dissipate energies associated with flow events, and thus are not reducing erosion, improving water quality etc.
- *Unknown*: Wetlands and riparian areas for which there is a lack of sufficient information to make any form of determination (BLM 2003e).

The Vernal FMP and Draft RMP identified the following riparian/wetland areas as having important values within the Vernal planning area:

Bitter Creek	Pariette Wetlands
Bitter Creek Marsh	Red Creek
Brush Creek	Sweetwater Creek
Goslin Mountain's wet and semi-wet meadows	White River
Evacuation Creek	Willow Creek
Green River	Meadow Creek
	Numerous other ephemeral and perennial streams and drainages

Preliminary riparian inventory revealed 295 miles and 3,674 acres of riparian areas currently in PFC, 133 miles and 1452 acres functioning at risk, and 79 miles and 1,213 acres not in properly functioning condition (BLM 2005). Functioning condition and the natural processes that affect functionality have been impaired in many areas through human disturbances and alterations and the infestation of non-native species. Humans have altered stream aquatic and riparian environments by direct modifications (channelization, wood removal, diversion, dam-building, irrigation de-watering) and indirect impacts (from timber harvest, mining, grazing, and road building). These activities have altered channels by changing the rate at which sediment, water, and wood enter and are moved through streams. Anthropogenic activities have also affected the incidence, frequency, and magnitude of the natural disturbance events described above (McIntosh et al. 1991; Wissmar et al. 1994).

Invasive species such as tamarisk, tall whitetop, and Russian olive have become well established in the riparian communities and are slowly replacing the native vegetation across much of Utah. This increase in tamarisk/Russian olive has altered the intensity and size of unplanned fires due to the increased fuel loads in the cottonwood understory, providing ladder fuels to the large cottonwood trees.

3.3.9 WILD AND SCENIC RIVERS

The WSRA (16 USC 1271-1287) established a National Wild and Scenic Rivers System and prescribed methods and standards through which additional rivers may be identified and added to the system. The purpose of the National Wild and Scenic Rivers System is to preserve the free-flowing state of rivers that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values. Rivers in the system are classified as wild river areas, scenic river area, or recreational river areas. WSRA established a method for providing federal protection for certain of our country's remaining free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations (NPS and USDI 1982). It also established management requirements to management decisions to protect both the eligible river, or river segments, and the land immediately surrounding them.

No rivers in Utah are included in the National Wild and Scenic Rivers System. However, the Wild and Scenic Rivers Act (WSRA) directs federal agencies to consider potential wild and scenic rivers in their land and water planning processes. The WSRA provides that suitable rivers or river segments be administered in such a way as to protect and enhance the values that made it eligible for the National System, but not to limit other uses that do not substantially interfere with public use and enjoyment of these values (Interagency Wild and Scenic Rivers Coordinating Council 2004).

Inventories in the Vernal Field Office have identified the rivers or river segments in **Table 3.3** as eligible for designation. Protective management is in place until the eligible river or river segment is determined, during the study phase, to be suitable or unsuitable. Suitability will be determined in the Record of Decision for the Vernal FO RMP/EIS. Once suitability is determined, only segments found to be suitable will be managed to protect the free-flow, outstandingly remarkable values, and recommended classification until Congressional action is taken.

TABLE 3.3: ELIGIBLE WILD AND SCENIC RIVER SEGMENTS

Segment Name	Segment Description	Outstanding Remarkable Values	Tentative Classification	BLM Shoreline Miles	Total Miles
Argyle Creek	Headwaters to Carbon County line	Scenic	Recreational	4.0	22.0
Bitter Creek	Utah state line to where it enters private property	Fish, wildlife/habitat, cultural, historic, recreational	Scenic	7.0	22.0
Evacuation Creek	Utah state line to confluence with White River	Historic	Recreational	7.0	21.0
Lower Green River	Between public land boundary south of Ouray and the Carbon County line	Recreational, fish	Scenic	27.0	30.0
Middle Green River	Between Dinosaur National Monument and public land boundary north of Ouray	Fish	Recreational	20.0	36.0
Nine Mile Creek (A)	Segment within Duchesne County between Carbon County line and confluence with Gate Canyon	Scenic, cultural	Recreational	7.0	13.0
Nine Mile Creek (B)	The segment within Duchesne County between Gate Canyon and the Green River	Scenic, cultural	Scenic	0.0	6.0
Upper Green River	Between Little Hole and Utah state line	Scenic, recreational, fish, wildlife/habitat, cultural	Scenic	12.0	22.0
White River (A)	The segment between Colorado state line and its confluence with Asphalt Wash	Scenic, fish, wildlife/habitat recreational, historic	Scenic	8.0	24.0
White River (B)	The segment between Asphalt Wash to where the river leaves Section 18, T10S. R23 E. SLBM	Scenic, fish, wildlife/habitat recreational, historic	Wild	10.0	10.0
White River (C)	The segment from where the river leaves Section 18, T10S. R23 E. SLBM to Indian Trust Land boundary	Scenic, fish, wildlife/habitat recreational, historic	Scenic	10.0	10.0

3.3.10 WILDERNESS STUDY AREAS

The Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat. 890) established the National Wilderness Preservation System and established guidelines for the designation and management of wilderness.

Wilderness, as defined in the Wilderness Act, is an area where, in contrast with those areas where man and his works dominate the landscape, the earth and its community of life are untrammelled by man, and where man himself is a visitor who does not remain. An area of wilderness is further defined to mean an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type

of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Wilderness areas can only be designated by Congress and are managed under the Wilderness Act. A WSA is an administrative designation designed to allow areas to be studied and considered by Congress for possible designation as wilderness. WSAs are managed to prevent impairment of their suitability for congressional designation as wilderness.

By policy, management of WSAs is generally less restrictive than wilderness areas, but activities, including fire management actions that would impair wilderness suitability are prohibited. Section 603 of FLPMA requires the BLM to protect the wilderness character of each WSA until Congress makes its decision, regardless of its recommendation.

There are approximately 54,042 acres designated for WSAs in the Vernal planning area. **Figure 3.4** and **Table 3.4** show the location and size (respectively) of WSAs in the Vernal planning area.

TABLE 3.4: WILDERNESS STUDY AREA ACREAGE

Name of Wilderness Study Area	Acreage
Book Cliffs Instant Study Area	399
Bull Canyon	598
Daniels Canyon	2,516
Diamond Breaks	3,926
West Cold Springs	3,283
Winter Ridge	43,320
TOTAL ACREAGE	54,042

3.3.11 LIVESTOCK GRAZING

Allotments

Livestock grazing is permitted on approximately 68 percent (1,670,877 acres) of BLM-administered lands in the Vernal planning area. For administrative purposes, the Vernal planning area is divided into 146 allotments. **Figure 3.5** presents livestock grazing allotment locations in the Vernal planning area.

Grazing allotments are geographically unique and range in size from 74,350 public acres to small isolated parcels of public land of less than one acre. Sizing affects how the allotments are managed. Allotments may be joined with private, state, other federal lands or a combination thereof, in addition to BLM-administered lands. Allotments may be permitted to one (individual allotment) or more (common allotment) operators. More than one permit may be issued to a particular individual or company.

Grazing allotments typically contain improvements constructed by the permittee or by the BLM. These improvements include water troughs, guzzlers, rain water catch basins and other water storage structures, fences, corrals, and other similar structures necessary for the successful use of the allotment.

FIGURE 3.4: WILDERNESS STUDY AREAS IN THE VERNAL PLANNING AREA

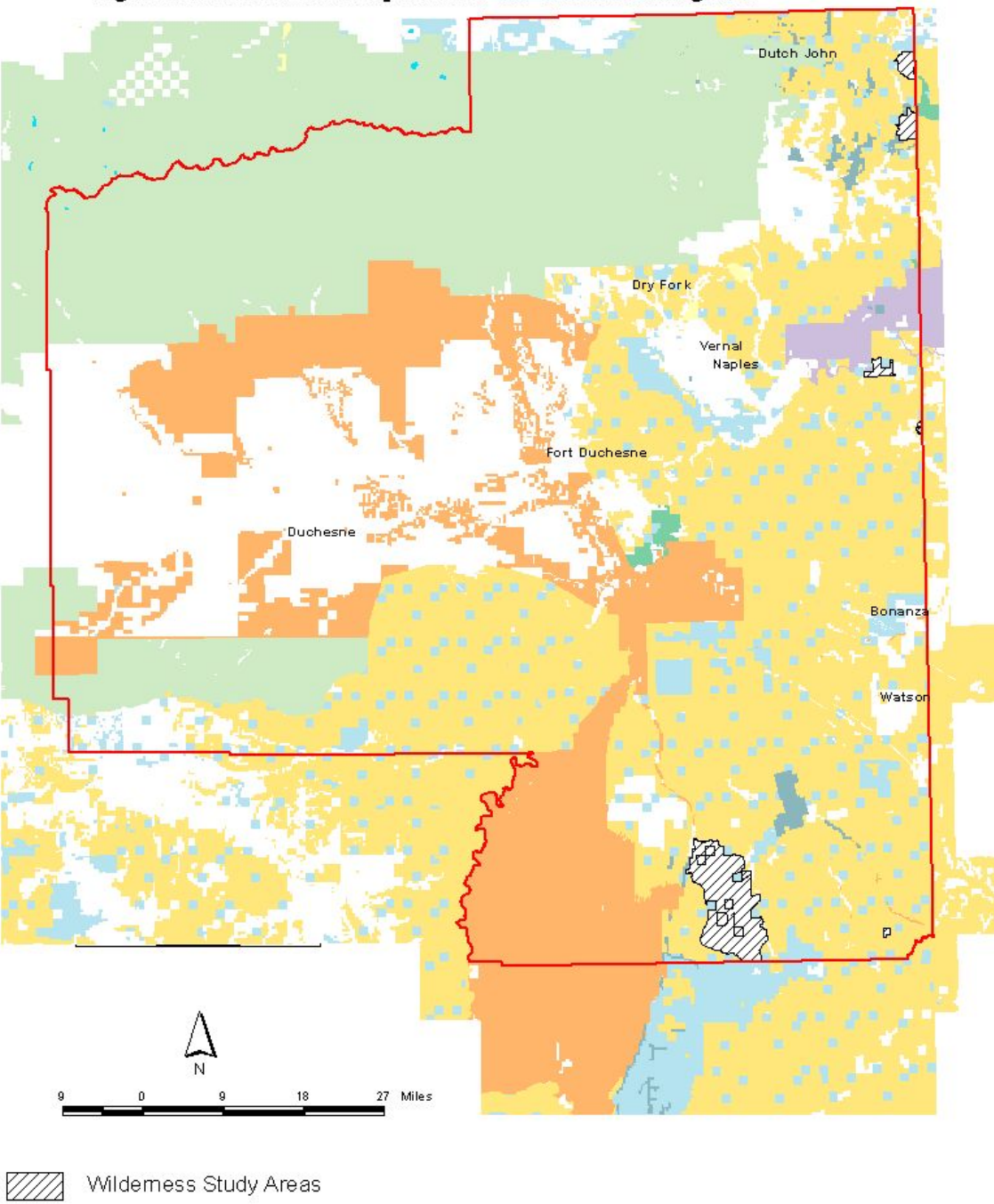
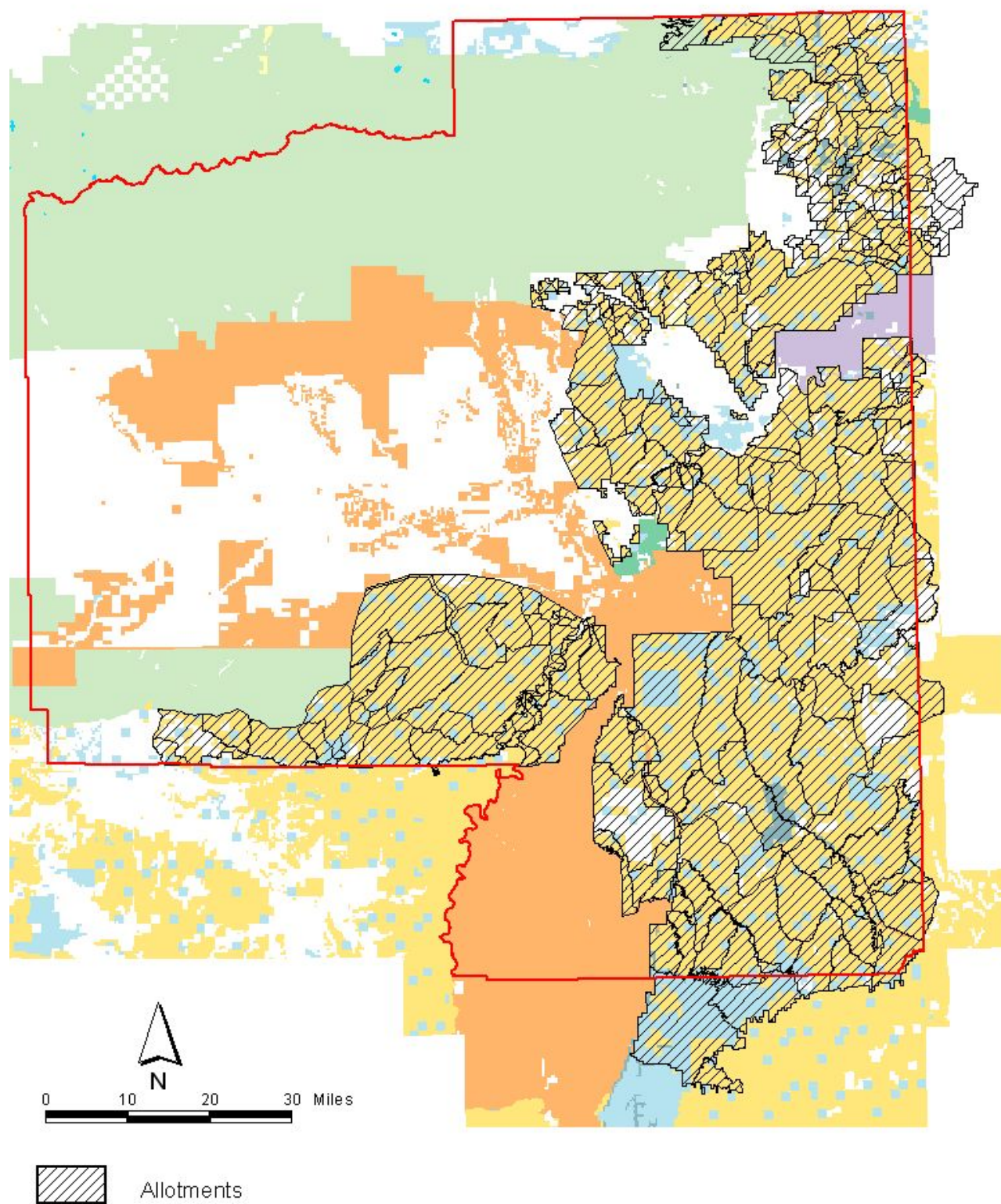


FIGURE 3.5: LIVESTOCK GRAZING ALLOTMENTS IN THE VERNAL PLANNING AREA



Grazing Systems

Seasons of use vary on each allotment throughout the Vernal planning area from a few-week season to a year-long season. Each grazing system may include periodic rest depending upon the specific management concerns and needs for that allotment. The season of use for each allotment is described in the operator's grazing permit. Season-long use entails grazing one pasture from spring or early summer to late summer or fall. Some movement of livestock use may occur within the pasture (e.g., from canyon to canyon). Deferred rotation is a technique that uses the entire allotment by rotating pasture use (e.g., livestock start in a different pasture each year). Rest-rotation of pastures is a technique that involves grazing during certain periods and resting during other periods, with some pastures rested for the entire grazing season. Grazing systems are designed based on the requirements of key forage species in the allotment, the resources of concern on the allotment and the needs of the livestock producer and their livestock.

Rangeland Health Standards

Allotments are periodically assessed for meeting multiple use objectives and all allotments are currently being assessed for meeting Utah's rangeland health standards. This effort is to be completed by the year 2009. Periodic allotment assessments may indicate that changes in the season of use or grazing system are necessary to meet rangeland health standards. If these assessments indicate that changes in livestock management are needed to meet standards or other multiple use objectives after consultation with the permittee, changes to the terms and conditions of the permit would be made through agreement or by decision.

3.3.12 WOODLANDS AND FORESTRY

Most existing wood product use is for firewood, Christmas tree and pine nut gathering, with a minor component for lumber and associated products.

Table 3.5 shows the occurrence of forest types (the forest types correspond to the compressed GAP classes described in Section 3.3.13), acreages for the Vernal planning area, and primary uses of the forests. The predominant forest type in the Vernal planning area is the pinyon and juniper woodland category. This is the most extensive forest type in Utah, exceeding in acreage all other forests combined (Lanner 1984). Efforts have been made to encourage the non-commercial thinning of pinyon and juniper woodland for firewood use in the past. The mixed conifer is comprised of fir, pine and spruce species.

TABLE 3.5: FOREST TYPES, ACRES, AND PRIMARY USES IN THE VERNAL PLANNING AREA

Vegetation Type	Approx. Acreage	Uses
Pinyon and Juniper Woodland	318,207	Firewood, specialty lumber, pine nuts, biomass
Mixed Conifer/Aspen	87,603	Mixed conifer is used for firewood, Christmas trees, pulp, lumber, log home construction, and fence posts. Aspen is used for packing material (dunnage), pallets, erosion blanket, swamp cooler filters, matches, specialty lumber, fuel, fence posts, and pulp.

Old-growth forests are generally defined as being older than 150 years old. The primary forest type identified within the Vernal planning area as likely to have old-growth areas is the pinyon and juniper woodland. Harvesting or other activities affecting old-growth forests are generally restricted.

3.3.13 VEGETATION

Vegetation in the Vernal planning area is grouped from the GAP analysis into vegetation groups with similar fire ecology (see **Figure 3.6**).

Fire Regime Condition Class

Vegetation response (and recovery) following disturbance (fire) over time is referred to as succession. The stages of vegetation types or communities are referred to as seral stages, with the end result referred to as climax. The presence of non-natives (and loss of native species) can affect succession. For example, cheatgrass changes the natural fire regime and may perpetuate through time and appear as climax. This altered (shortened) fire return interval can be as little as five years and may allow the species to expand dramatically their range and coverage after fires.

FRCC is an interagency, standardized tool for determining the degree of departure from reference condition vegetation, fuels, and disturbance regimes. Assessing FRCC can help guide management objectives and set priorities for treatments. FRCC was assigned to vegetation on public lands within the state through review of vegetation types identified by GAP (Edwards et. al. 1998), and elevation ranges. The definitions for FRCC are presented in **Table 3.6**. **Table 3.7** presents vegetation acres and associated Fire Regimes and Condition Classes in the Vernal planning area.

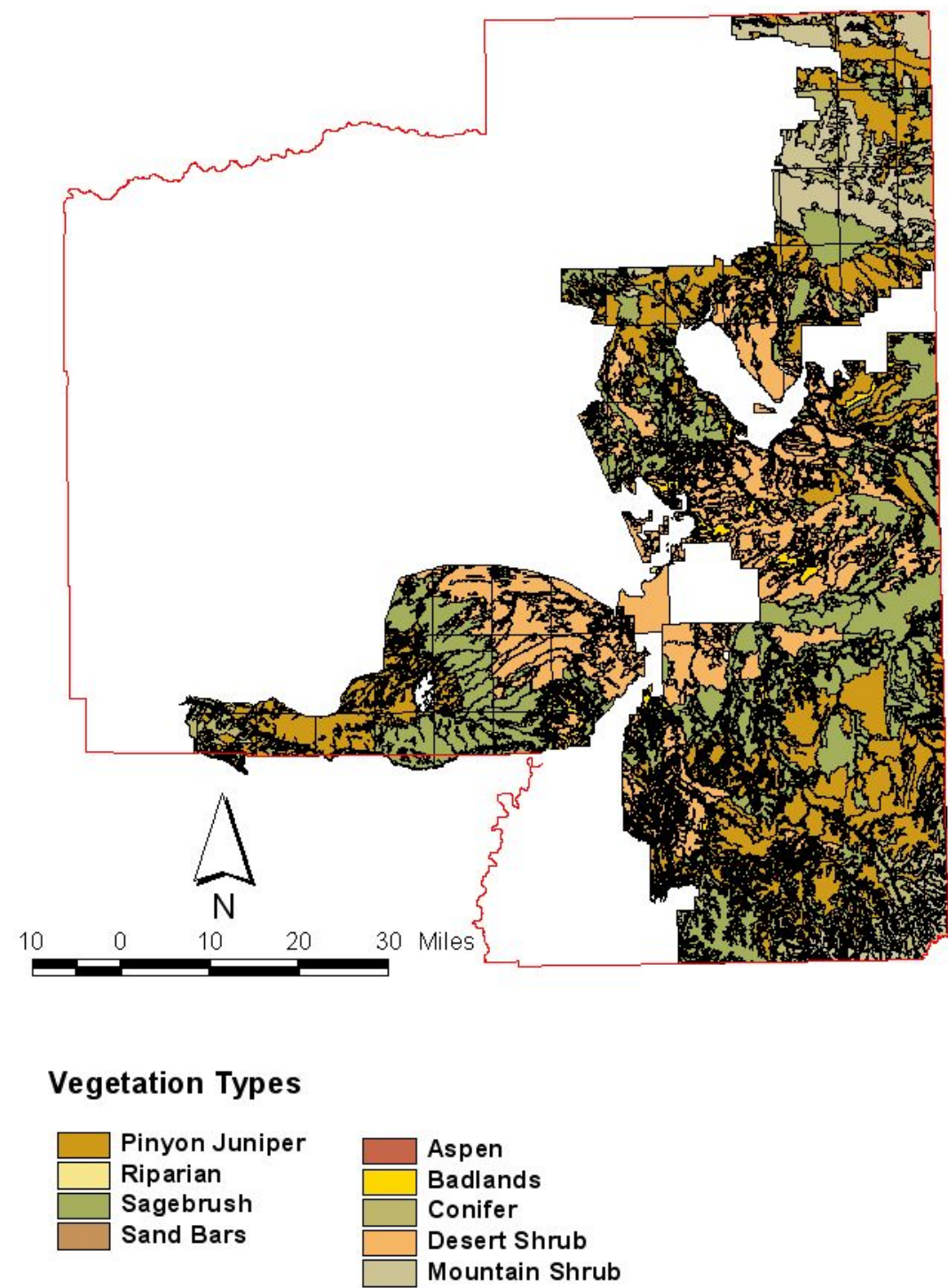
TABLE 3.6: GENERAL FIRE REGIME CONDITION CLASS DESCRIPTION

FRCC	Description
1	Within the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.
2	Moderate departure from the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.
3	High departure from the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.

TABLE 3.7: VEGETATION TYPE ACRES IN THE VERNAL PLANNING AREA

Vegetation Type	Approx. Acreage of BLM-Administered Land	Percent of Lands	Fire Regime	Fire Regime Condition Class
Sagebrush	589,094	35%	II, III	2 (59%) 3 (41%)
Salt desert shrub	419,521	29%	V	3 (100%)
Pinyon and juniper woodland	318,207	18%	II or V (old growth)	2 (98%) 3 (2%)
Mountain shrub	193,990	11%	I, II, and IV	2 (100%)
Mixed conifer	86,474	5%	III and IV	3 (100%)
Riparian	5,454	0.3%	IV	2 (9%) 3 (81%)
Aspen	1,129	<0.1%	IV	3 (100%)
Ponderosa pine	961	<0.1%	I	3 (100%)
TOTAL ACREAGE	1,614,830			

FIGURE 3.6: VEGETATION TYPES ON BLM-ADMINISTERED LAND IN THE VERNAL PLANNING AREA



Sagebrush

Unlike the salt desert shrub type, which grows as mixed stands in poor soils, big sagebrush grows in non-saline, well-drained valleys and slopes and mostly forms monotypic stands. It is generally found above the valley bottoms, immediately below the pinyon and juniper woodland type.

Since sagebrush develops in seral stages, many of the acres of native, perennial grasslands and areas may be considered early seral sagebrush communities. In addition, some areas classified as pinyon-juniper may actually have been sagebrush historically (pinyon-juniper have encroached into shrublands). At the scale of mapping for this EA, many areas identified as annual and perennial grasslands or pinyon-juniper woodlands may contain inclusions of remnant sagebrush steppe communities.

Healthy sagebrush is a patchwork mosaic of seral communities that range from recovering perennial grass-shrublands following natural fire, to old growth, decadent sagebrush steppe with high canopy cover and reduced herbaceous understory (Wyoming Interagency Vegetation Committee 2002). The three main subspecies of big sagebrush (*Artemisia tridentata*) found along with a dwarf sagebrush species (*Artemisia nova*) in the Vernal planning area are as follows:

- Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) is the most common shrub in the intermountain basins (Knight 1994). It grows in pinyon and juniper woodland and below on plains and foot-hills at elevations of 5,000 feet to 7,000 feet. Associated grasses are often scarce in this big sagebrush type.
- Basin big sagebrush (*Artemisia tridentata tridentata*) grows with Wyoming big sagebrush but is confined to valley bottoms in deep, well-drained sandy to loamy soils at 4,000 to 7,300 feet in elevation. Basin big sagebrush grows taller (up to six feet) and blooms later than Wyoming big sagebrush.
- Mountain big sagebrush (*Artemisia tridentata vaseyana*) grows in pinyon and juniper woodland and above, on foot-hills, and mountain sides at elevations of 5,100 to 10,200 feet in the 14- to 20-inch precipitation zones, with cooler soils and more resilient, intact native communities than low elevation sagebrush (especially the upper end). They are more susceptible to juniper encroachment, mainly as a result of fire suppression, depending on the soil.

On the drier sites, much of the sagebrush communities have degraded with extensive conversion to cheatgrass-dominated understories.

Salt Desert Shrub

This vegetation type is perhaps the most arid vegetation type in the Intermountain West (Wood and Brotherson 1986). Salt desert shrub occurs in valleys at the lowest elevation. This vegetation type grows in areas characterized by accumulations of salt in poorly developed soils. This vegetation type includes salt-tolerant, succulent shrubs like greasewood, ephedra, shadscale, four-wing saltbush, and threadleaf rubber rabbitbrush. Common grasses include inland saltgrass, alkali sacaton, bottlebrush squirreltail, and Indian ricegrass. Forbs are numerous but seldom are any one species abundant (Goodrich and Neese 1986). Biological crusts are usually present and cover most of the interspaces between shrubs in intact, native species-dominated salt-desert shrub types. Salt desert shrub generally has low productivity, naturally sparse understory vegetation and light fuels.

In the past 40 years, large expanses of salt desert shrub have been overtaken by invasive annual grasslands and annual forbs. Currently, cheatgrass has invaded all of the salt desert type found on the Vernal planning area and approximately much of this vegetation type now provides sufficient fuel loading to support large, fast-moving fires. Where cheatgrass has invaded, native salt desert shrub communities have been permanently lost or are at high risk of loss.

Pinyon and Juniper Woodland

Trees that are less than 33 feet in height characterize this vegetation type. The open conifer woodlands form savannah-like landscapes with moderately open to very open canopies (25 to 59 percent canopy cover). The overstory includes Colorado pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) as a common associate. Typically, the understory consists of shrub species like big sagebrush and native bunchgrasses like bluebunch wheatgrass (*Agropyron spicatum*). Many areas of pinyon-juniper woodlands are characterized by closed woodlands (greater than 60 percent canopy cover) and due to competition for sunlight, water, and nutrients, the understory is drastically reduced. Also, juniper litter may further inhibit understory growth.

On lower edges of the woodland zone, Utah juniper is frequently the only tree species with a mixture of the two in the middle and pinyon with little or no juniper in the upper elevations. Utah juniper is the more xeric of the two, often serving as nurse trees for pinyon in well-developed woodlands.

Junipers are considered climax species for a number of pinyon and juniper, sagebrush steppe, and shrub steppe habitats (sagebrush improves soil fertility and creates a microclimate underneath that favors the establishment of young juniper trees). An increase in sagebrush cover following livestock grazing has created a more favorable environment for juniper invasion (Knight 1994). Consequently, Utah juniper increases with grazing and has spread from thin substrates along ridges and mountain slopes to deeper valley soils. On thin substrates where it is not seral, reclamation efforts have been partially successful. Many areas where juniper encroachment has occurred have also been invaded by cheatgrass in the understory, which raises concerns of further cheatgrass expansion following fire.

Mountain Shrub

This vegetation type consists of a variety of shrubs: Gambel oak, maple, mountain mahogany, and mixed mountain shrub (a highly diverse community made up in part of chokecherry, serviceberry, currant, snowberry, elderberry, bitterbrush, mountain big sagebrush, nine-bark, ceanothus, and others). This vegetation type is found above the pinyon-juniper zone and below the conifer zone. It is found at moderately high elevations (7,000 to 8,500 feet) and on north and east slopes that tend to be cooler and moister than south and west aspects (the exception is mountain mahogany and oak, which occur on south aspects).

Mixed Conifer

This vegetation type, typically occurring at elevations above 7,000 feet, consists of major forest community types of mixed conifer, which may include Douglas-fir, white fir, Englemann spruce and sub-alpine fir. This type occupies less than one percent of BLM-managed lands on the Vernal District. As a result of fire suppression and grazing, species like Douglas-fir (which has thick bark like ponderosa pine) have invaded lower elevation communities.

Because there are numerous community types associated with this vegetation type, condition and trends vary. In those conifer types associated with aspen, the trend is towards a greater representation of climax vegetation, with a corresponding loss of early seral stage aspen. In other conifer types that lack the aspen component, the increasing density of shade tolerant species can place greater stress on larger older trees, mostly due to between-tree competition for water. Increased stress results in a greater susceptibility to insect and disease attack (Keyes et al. 2003). In many sites, the stocking index is many times greater than pre-settlement times, resulting in an increased likelihood of stand-replacing fire.

Riparian

Riparian vegetation is typically comprised of narrow stringer communities along both sides of rivers and streams. Native vegetation in Vernal's riparian areas may be dominated by Fremont cottonwoods with

understories of shrubs (e.g., sandbar willow) and herbaceous species. Fremont cottonwood communities are characterized by a late seral stage (e.g., all mature to late-mature trees) with little or no representation of younger age-classes and are not typically fire-adapted. The life history and ecology of cottonwoods are intimately tied with flooding, erosion, and deposition on the flood plains. Cottonwoods release seed corresponding with the flood season because the seeds only germinate and establish on freshly deposited, moist alluvium (point bars). This frequently creates bands of trees that provide a living record of flooding patterns and channel migration with younger age classes near the water's edge (green-line) and older trees occurring some distance from the channel in the flood plain (Knight 1994).

Due to altered stream flows that exist in the native cottonwood communities, the trend is toward a greater representation of climax vegetation, with a lack of recruitment by younger age classes as well as possible mortality to older individuals. In others, many of the native riparian communities have been converted to exotic tamarisk and Russian olive and/or noxious weeds.

Aspen

Aspen-dominated types can be climax or seral to conifer communities and are found at elevations between 6,500 feet and 10,500 feet. Aspen occurring as pure stands are considered climax and are considered seral when in association with various conifers such as Engelmann spruce, ponderosa pine, white fir, sub-alpine fir, and Douglas-fir. Although conifer invasion is a natural pattern in seral aspen stands, fire suppression has resulted in an increased representation and dominance by conifer in aspen stands, thus reducing the extent of aspen-dominated stands (Mueggler 1989). Aspen is a fire-dependent species and because aspen is a fast-growing and short-lived species, in the absence of fire the aboveground stems tend to become decadent and diseased.

Ponderosa Pine

Ponderosa pine occupies the warmest, driest forest sites away from cold air drainages. Because ponderosa pine tolerates a broader range of environmental conditions than most of its associates, this type has no particular community type, but rather the understory constitutes whatever community is growing nearby. It can occur as a climax type at lower elevations or seral with some other type like Douglas-fir at higher elevations.

3.3.14 FISH AND WILDLIFE

For the purpose of this document, general fisheries and wildlife refers to species and groups of similar species that do not have federal status (as defined in BLM Manual 6840, including ESA-related species) and are not considered BLM sensitive species. However, these species may have other federal and/or state protection (e.g., under the Federal Migratory Bird Treaty Act or Utah State Code) and are of concern to management authorities, Native American tribes, the general public, or groups (e.g., birders, hunters, etc.) with particular interest in a species or group of species.

General fisheries and wildlife groups considered in this document include fisheries, non-game (raptors, migratory birds, small mammals, carnivores and predators, and amphibians and reptiles) and big game (mule deer, Rocky Mountain elk, moose, Rocky Mountain bighorn sheep, pronghorn, and bison). ESA-related and BLM sensitive species are discussed earlier in this chapter. Scientific names and habitat associations for each of the species within the Vernal planning area mentioned in this section are presented in **Table 3.8**.

TABLE 3.8: HABITAT ASSOCIATIONS FOR GENERAL FISH AND WILDLIFE SPECIES

Common Name	Species	Habitat*
Fisheries		
Rainbow trout	<i>Oncorhynchus mykiss</i>	W
Brown trout	<i>Salmo trutta</i>	W
Brook trout	<i>Salvelinus fontinalis</i>	W
Lake trout	<i>Salvelinus namaycush</i>	W
Birds		
Ferruginous hawk	<i>Buteo regalis</i>	SDS, S, PJ, S, G,
Red-tailed hawk	<i>Buteo jamaicensis</i>	SDS, PJ, S, G, MS, MC, A
Northern goshawk	<i>Accipiter gentiles</i>	MC, A
Golden eagle	<i>Aquila chrysaetos</i>	SDS, PJ, G, MS, MC, RW, A, W
American kestrel	<i>Falco sparverius</i>	SDS, G, MC, PP, RW, A
Osprey	<i>Pandion haliaetus</i>	RW, W
Northern harrier	<i>Circus cyaneus</i>	G, RW
Turkey vulture	<i>Cathartes aura</i>	SDS, PJ, S, G, MS, MC, PP, RW, A, W
Lewis' woodpecker	<i>Melanerpes lewis</i>	MS, PP, RW
Abert's towhee	<i>Pipilo abertii</i>	RW
American avocet	<i>Recurvirostra americana</i>	RW
Mountain plover	<i>Charadrius montanus</i>	SDS
Lucy's warbler	<i>Vermivora lucidae</i>	SDS, RW
Sage grouse	<i>Centrocercus urophasianus</i>	S
American white pelican	<i>Pelecanus erythrorhynchos</i>	RW, W
Bobolink	<i>Dolichonyx oryzivorus</i>	RW
Virginia's warbler	<i>Vermivora virginiae</i>	PJ, MS
Gray vireo	<i>Vireo vicinior</i>	PJ, MS
Bell's vireo	<i>Vireo bellii</i>	RW
Black rosy finch	<i>Leucosticte atrata</i>	G
Long-billed curlew	<i>Numenius phaeopus</i>	G
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	S, G
Brewer's sparrow	<i>Spizella breweri</i>	SDS, S
Black swift	<i>Cypseloides niger</i>	RW
Black-necked stilt	<i>Himantopus mexicanus</i>	RW
Broad-tailed hummingbird	<i>Selasphorus platycercus</i>	RW
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	RW
Black-throated gray warbler	<i>Dendroica nigrescens</i>	PJ, MS
Three-toed woodpecker	<i>Picoides tridactylus</i>	MC
Sage sparrow	<i>Amphispiza belli</i>	SDS, S
Gambel's quail	<i>Callipepla gambelii</i>	SDS, RW
Flammulated owl	<i>Otus flammeolus</i>	MC, PP, RW, A
Tree swallow	<i>Tachycineta bicolor</i>	MC, PP, RW, A
Black-capped chickadee	<i>Parus atricapillus</i>	MC, PP, RW, A
Mountain chickadee	<i>Parus gambeli</i>	MC, PP, RW, A
Mammals		

Common Name	Species	Habitat*
Silver-haired bat	<i>Lasionycteris noctivagans</i>	MC, PP, RW, A
Ringtail	<i>Bassariscus astutus</i>	MC, PP, RW, A
Black bear	<i>Ursus americanus</i>	MS, MC, PP, RW, A
Mountain lion	<i>Felis concolor</i>	PJ, MS, MC, PP
Coyote	<i>Canis latrans</i>	SDS, PJ, S, G, MS, MC, A
Mule deer	<i>Odocoileus hemionus</i>	S, MS
Rocky Mountain elk	<i>Cervus elaphus</i>	G, MS, MC, A
Moose	<i>Alces alces</i>	G, MS, MC, RW, A
Rocky Mountain bighorn sheep	<i>Ovis canadensis canadensis</i>	S, G, MS
Pronghorn	<i>Antilocapra americana</i>	SDS, S, G
Bison	<i>Bos bison</i>	G, MS, MC, PP, A

*Habitat Codes: SDS = salt desert shrub, PJ = pinyon and juniper woodland, S = sagebrush, G = grassland, MS = mountain shrub, MC = mixed conifer, PP = ponderosa pine, RW = riparian/wetland, A = aspen and W = water

Fisheries

Important native fish species found in the Vernal planning area that are not ESA-related or BLM sensitive species include rainbow, brown, brook, and lake trout. Native fish demonstrate a wide variety of life histories, including resident populations inhabiting small headwater streams with shorter migratory ranges, populations using larger streams and main rivers, populations in lake habitats, and populations spawning in rivers or streams.

The quality of aquatic habitats varies widely across the state. Generally, aquatic habitats have declined since settlement of the region began in the 1850s. Disturbances contributing to decline of habitat have included logging, grazing, mining, recreation, water diversion for irrigation and domestic supply purposes, other surface disturbing activities, and introduction of non-native species, as well as wildland fire, insect infestation, disease, wind, floods, landslides, avalanches, and other surface-disturbing activities. These disturbances have resulted in loss of riparian vegetation and subsequent changes in vegetation species composition.

Non-game Species

For the purposes of this document, non-game species are identified as raptors, migratory birds, small mammals, carnivores and predators, and amphibians and reptiles.

Raptors: Raptors (birds of prey) found in and adjacent to the Vernal planning area include several species of hawks (e.g., ferruginous hawk, red-tailed hawk, and northern goshawk), eagles (e.g., golden eagle), falcons (including the American kestrel), owls, ospreys, northern harriers, and turkey vultures. These species inhabit various ecosystems and consume a wide range of prey.

During the breeding season, raptors are particularly sensitive to disturbance. Behavior during and following disturbance could result in nest abandonment or reduced productivity. Accordingly, raptors are provided with protection designed to prevent disturbance under the Migratory Bird Treaty Act of 1918, and Eagle Protection Act of 1962 (as amended). In addition, the Utah field office of the USFWS has issued guidelines for establishment of disturbance-free buffer zones around raptor nests, and the identification of mitigation techniques available for use when management or development activities conflict with the buffer zones. In Utah, the largest buffer zone suggested for any raptor nest is one mile (Romin and Muck 2002).

Migratory Birds: Migratory birds travel from one region to another, usually twice a year, spring and fall, for breeding or feeding purposes. Generally, they nest in temperate North America and over-winter in portions of Mexico and Latin America. Migratory birds represent a diversity of species, including shorebirds,

waterfowl, passerines (perching birds), and raptors, and may nest in any or all of the vegetation types within the Vernal planning area.

Utah Division of Wildlife Resources (UDWR) has prepared the Partners in Flight Avian Conservation Strategy (Parrish et al. 2002), a document evaluating the status of 231 bird species, many of which are migratory, that breed in Utah. Twenty-four bird species have been prioritized for management and protection, and occur mostly within four habitat types that have been designated by UDWR as priority habitats. These habitats include salt desert shrub, pinyon and juniper woodland, sagebrush, and riparian/wetland (Parrish et al. 2002). The 24 priority bird species include the Lewis' woodpecker, Abert's towhee, American avocet, mountain plover, Lucy's warbler, sage grouse, American white pelican, bobolink, Virginia's warbler, gray vireo, Bell's vireo, black rosy finch, long-billed curlew, sharp-tailed grouse, Brewer's sparrow, black swift, black-necked stilt, broad-tailed hummingbird, ferruginous hawk, yellow-billed cuckoo, black-throated gray warbler, three-toed woodpecker, sage sparrow, and Gambel's quail.

Some migratory birds are cavity nesters and may be found in forested habitat of varying elevation throughout the state. Cavity-nesting birds include several species of woodpecker. Woodpeckers are considered primary cavity nesters because they typically excavate their own nest cavities. Secondary cavity nesters are often incapable of excavating their own nest cavities and, therefore, rely upon existing cavities that have been previously established by woodpeckers. Secondary cavity nesters include species such as the American kestrel, flammulated owl, tree swallow, and black-capped and mountain chickadees. While cavities may be excavated in live trees, standing dead trees (e.g., snags) are typically preferred by primary cavity nesters and may be easier for secondary cavity nesters to access. Trees in the mixed conifer, ponderosa pine, aspen, and riparian/wetland habitat types each contain important nesting resources for cavity-nesting species.

Small Mammals: Small mammals include species groups such as bats, squirrels, mice, and rabbits. Because these groups fill a variety of niches, small mammals are found in most habitat types within the Vernal planning area. Although the term "cavity nester" typically refers to bird species, it may include small mammals that use cavities for denning. Small cavity-nesting mammals include silver-haired bat and ringtail.

Carnivores and Predators: These species are generally large, long-lived, solitary species. Although they are considered here to be non-game species, a variety of carnivores are managed by UDWR. More plentiful carnivores are often hunted for food, sport, or as a management technique to allow prey species to thrive. Utah predators include black bear, mountain lion, and coyote. Although the black bear and mountain lion tend to remain more secluded in the mountain shrub and mixed conifer communities of mountains and foothills, the coyote may venture into urban and agricultural areas as a means of finding vulnerable prey. In general, where there is a prey source, there are predators. And because predators consume birds and small mammals and often travel over large distances, they may be found anywhere within the Vernal planning area.

Amphibians and Reptiles: Because the majority of Utah's wildlife habitats are arid or semi-arid and small percentage of habitats are associated with water, reptiles are more prominent than amphibians. Reptiles are found throughout the Vernal planning area and may occur in any habitat type. Amphibians are found in and adjacent to wetlands, rivers and streams, mountain lakes, runoff pools in rock formations, and both ephemeral and permanent livestock watering ponds.

Big Game Species

Big game species include large, hunted animals such as mule deer, Rocky Mountain elk and pronghorn. Given the economic importance of big game, this group is typically managed more closely than other wildlife groups. Accordingly, UDWR has identified critical seasonal use ranges within the Vernal planning area for mule deer, Rocky Mountain elk, moose, Rocky Mountain bighorn sheep, pronghorn, and bison.

Mule Deer: Mule deer occupy most ecosystems, but are characteristically found in shrublands with rough, broken terrain and abundant browse and cover. Mule deer winter diets consist primarily of browse in the form of sagebrush, bitterbrush, mountain mahogany, and other shrubs, as well as a small amount of grasses and trees (e.g., pinyon or juniper). During the other three seasons, there is much wider distribution of nutritional resources. Mule deer summer use habitat primarily consists of mixed conifer, aspen, riparian and wetland, and grassland, while winter habitat primarily consists of low-elevation sagebrush and mountain shrub habitats on south-facing slopes.

Rocky Mountain Elk: The Rocky Mountain elk is a generalist, feeding on forbs and grasses during the spring and summer and grasses and shrubs throughout the fall and winter. These feeding relationships are variable and depend largely on location. Various habitats include winter ranges, calving areas and summer ranges. Calving areas are used from mid-May through June. They are typically located at higher elevations than wintering grounds; consist of grassland, mountain shrub, mixed conifer, and aspen; and occur near cover, forage, and water resources (Fitzgerald et al. 1994).

Moose: The moose in Utah is typically associated with riparian and wetland and mountain shrub habitats. It feeds on leafy plants, as well as trees and shrubs including aspen, birch, and willow. Before 1918, moose did not readily occur in Utah. Since that time, moose populations have increased and they are found throughout the northern portions of Utah, in places closely associated with mixed conifer, aspen, mountain shrub, riparian and wetland, and grassland habitats (Zeveloff and Collette 1988).

Rocky Mountain Bighorn Sheep: Bighorn sheep inhabit remote, mountain, and desert locations, and are often found on cliffs and rocky slopes in rugged canyons. They are most closely associated with sagebrush, grassland, and mountain shrub habitats (Chapman and Feldhamer 1982). Bighorn sheep are active during the daytime and feed on grasses, trees, and shrubs, depending upon availability, succulence, and nutrient content. The Rocky Mountain bighorn sheep can be found in several mountain ranges in central and northern Utah (UDWR 2004a).

Pronghorn: The pronghorn is typically associated with salt desert shrub, sagebrush, and grassland habitats throughout its entire range (UDWR 2004b). It is most active during the daytime and consumes sagebrush, thistle, cacti, grasses and forbs (UDWR 2004b). There are 24 pronghorn management units within the state. Pronghorn population levels are subject to drought, and most units have suffered a substantial population decline during the current six-year drought. Pronghorn populations are expected to rebound as the drought subsides.

3.3.15 SOILS

Soils in the Vernal planning area have developed from bedrock, volcanic activity, rocks and minerals deposited by rivers and glacial activity, windblown silt and sand. They are derived primarily from the sedimentary, metamorphic quartzite and volcanic rocks of the Uinta Mountains, Diamond Mountain Plateau, Avintaquin Mountains, East Tavaputs Plateau, Roan Cliffs, and Book Cliffs, which form the boundaries of the Uinta Basin and Browns Park. Soil source materials or substrates found in the Vernal planning area fall into the soil types such as alluvium, calcareous, clay, conglomerate, duff, granitic, gravelly loam, gypsiferous, igneous, limestone, loam, quartzite, sandstone, sandy and shale.

Soils in the Vernal planning area are composed of a wide variety of soil types and characteristics. Certain soil types have chemical and physical characteristics that may favor certain vegetation types and combined with climatic influences, can provide habitats for various plant species. Certain soil types also have chemical features that limit restoration and make reclamation difficult, these include sodium, soluble salts, carbonates, and gypsum. Physical soil characteristics that may limit reclamation include sandy soils, clayey soils, large coarse fragments (e.g., stones and boulders), shallow depth to parent material, and low organic matter

content. A shallow depth to groundwater limits reclamation of hydric soils. Soils with these features are referred to as limiting soils.

The presence of biological crusts in arid and semi-arid lands influences the soil environment by reducing soil erosion (from both wind and water), fixing atmospheric nitrogen, retaining soil moisture and providing living organic surface mulch. This crust consists of a variety of cyanobacteria, green algae, lichens, mosses, microfungi and other bacteria (Belnap and Lange 2003). A crust's development is strongly influenced by soil texture, soil chemistry, and successional colonization by crustal organisms. In some ecosystems, such as those characterized by highly erosive marine sediments and little vegetative cover, physical crusts such as vesicular chemical crusts and desert pavement can also provide protection from wind erosion.

The Natural Resource Conservation Service has conducted three soil surveys throughout the Vernal planning area, with second and third order delineation. The Uintah Area survey includes parts of Daggett, Grand, and Uintah Counties. Portions of Daggett County are also included in the Henrys Fork Area soil survey. The Duchesne County part of the Vernal planning area is covered in the Duchesne Area soil survey. Information on soil features and use ratings for the Uintah Area and Henrys Fork Area surveys are available in digital format (<http://soildatamart.nrcs.usda.gov>). The Duchesne Area survey is not yet available in digital format but is expected to be available in 2005.

Erosion and Run-off

Soils may be eroded by water or wind. Water erosion is influenced by the intensity and durations of precipitation, soil texture, soil organic matter, permeability, topography, and vegetative (or artificial) cover. Areas with soils on steep slopes with low infiltration rates and minimal vegetative cover have the highest erosion hazard. Wind erosion also has the potential to move large volumes of soil and primarily a function of wind velocity and grain size (Ritter et al. 1995).

Erosion may decrease soil productivity, expose plant roots, impede revegetation efforts and increase salinity downstream. Many soils throughout the Vernal planning area have features that make reclamation and revegetation difficult. These limiting features involve salinity, sodium content, clayey and sandy textures, drought conditions, alkalinity, low organic matter content, shallow depth to bedrock, stones and cobbles, propagule-rich soil and high wind-erosion potential. Certain geological formations, such as the Mancos shale, tend to form soils that are highly erosive. The hazard for soil erosion by water and wind is rated at the county level soil surveys conducted by the National Resource Conservation Services (<http://soildatamart.nrcs.usda.gov>).

Soil Quality and Health

The capacity of a soil to sustain plant and animal productivity is related to its inherent physical, biological, and chemical properties as well as its current health or condition. Three key attributes of soil and rangeland health have been identified that may assist in assessing the status or health of an area: site stability, hydrologic function, and biotic integrity. Site stability relates to the ability of the soil to resist erosion (and loss of nutrients) by wind and water. Hydrologic function is the capacity of the site to capture, store and safely release water from rainfall and snowmelt. Biotic integrity is the capacity of a site to support both functional and structural plant, animal and soil biological communities within the range of variability for that site (BLM 2000).

Effects of soil health and erosion are often associated with wetlands and riparian areas and water quality. These resources are discussed in the Section 3.3.7 (water quality).

3.3.16 RECREATION

Recreation is one of the major resource uses within the Vernal planning area. The term “recreation” includes a variety of activities that affect and are affected by resources and other resource uses. The Vernal planning area offers a wide variety of recreational opportunities, especially for dispersed use requiring undeveloped open space. These include wildlife viewing, hunting, hiking, backpacking, horseback riding, off-highway use, fishing, bicycling, photography, camping, orienteering, river running, rock climbing, mountain biking, and sightseeing.

Recreational use is counted as visitor use and is measured in visitor days. A visitor day represents one person doing an activity for all or part of one day. For example, if one person spent one night camping on public lands, it is counted as two visitor days. More than seven million visitor days occurred on Utah public lands in 2002 (BLM 2003f).

Recreation resources include recreation sites and dispersed public lands, wildlife resources, visual resources, waterways, lakes, and other resources (physical, historical, etc.), each of which provides different recreational opportunities.

In areas where recreation resources receive heavy use, developed recreation sites are often constructed to aid in managing impacts. Consequently, developed recreation sites are primarily located near high-use recreation attractions.

These developed recreation areas may include such permanent features as:

- Picnic tables
- Drinking water facilities
- Vault toilets/shower facilities
- Shade structures
- Parking lots with traffic flow controls such as striping, islands, boulders, and rope fences
- Water drainage systems
- Signage; including maps, brochures, speed limits, recreation safety, wildlife and noxious weed information
- Bulletin boards and visitor registration/fee stations
- Traffic counters

Recreation sites and areas present within the Vernal planning area are shown in **Table 3.9**.

TABLE 3.9: RECREATION SITES IN THE VERNAL PLANNING AREA

Site Name	Recreation Features
Brown's Park/Green River, Bridge Hollow Campground, Indian Crossing	Camping, interpretive/ranger station, equestrian facility, boat ramp, fishing, wildlife viewing, scenic byway
Fantasy Canyon	Hiking, pictograph observation
Pariette Wetland	Hiking, fishing, wildlife observation
White River	Boating, fishing, scenic views
Dry Fork Canyon	Picnicking, mountain biking, pictograph observation
Drive Through the Ages	Scenic byway, wildlife viewing
John Jarvie Ranch	Historic site, interpretive self-guided tour, camping, fishing, river access
Pelican Lake	Boating
Book Cliffs Recreation Management Area	Hunting, wildlife viewing, geologic points of interest, off-highway

Site Name	Recreation Features
	vehicles, hiking, mountain biking, horseback riding.

The growth in the use of off-highway vehicles (OHVs) on public land has substantially increased over the past few years. In 1999 alone, sales of all terrain vehicles in Utah jumped more than 30 percent. The Utah BLM takes a balanced approach to managing OHV use, placing priority on protecting public land resources, while providing diverse opportunities for the responsible use of OHVs (BLM 2001).

During the RMP process, OHV areas are designated as open, limited, or closed. An open designation allows intensive OHV use where there are no compelling resource protection needs, user conflicts, or public safety issues. An area designated as limited restricts OHV use to meet specific resource management objectives. Limitations may occur on number or type of vehicles, time and season of use, or specific roads. An area is designated as closed to protect resources, ensure visitor safety, or reduce user conflicts.

More than 575,000 OHV visitor days occurred on BLM lands in 2002 (BLM 2003f). Within the Vernal planning area there are approximately 787,859 acres open to OHV use, 887,275 acres that are limited, and 50,388 acres that are closed (BLM 2005).

3.3.17 SOCIOECONOMICS

Region of Influence

The Vernal planning area, which encompasses Daggett, Duchesne, and Uintah Counties, represents the region of influence (ROI) for social and economic activities pertaining to the Vernal FMP. The ROI is defined as the geographical area in which the principal direct and indirect socioeconomic effects of the Proposed Action and the alternatives for the Vernal planning area are likely to occur.

Population and Employment

Baseline data for the Vernal ROI includes population and demographic data as well as current business and economic statistical information for the state obtained from the Bureau of Labor Statistics and Bureau of the Census, based on 2000 census data. Additional information was obtained from population, employment, earnings, and personal income trends-derived data compiled from the Sonoran Institute database prepared for the BLM (Sonoran Institute 2005). These data are available in the project file and are summarized below.

The ROI counties collectively had a total population in 2000 of 40,516. The primary population centers include the towns of Roosevelt and Duchesne in Duchesne County, Vernal and Naples in Uintah County, and Dutch John in Daggett County. Vernal is the largest town in the ROI, with a population of approximately 7,900 (U.S. Census Bureau 2003). The ROI is predominantly rural, however, and the majority of residents in each ROI county lives on farms, ranches, or on unincorporated county land. State, federal, and Indian reservation lands make up the majority of the land area of the ROI. These lands account for 72 percent of the total area of Duchesne County, 81 percent of the total lands in Uintah County, and 89 percent of the land in Daggett County. Private lands adjoining public land can be particularly vulnerable to wildland fire.

While farming and agriculture-related employment comprises only about 10 percent of the total employment in the ROI, most of these activities are associated with livestock grazing. Notably, Daggett County's economy is based primarily on the raising of livestock, hay, and alfalfa, with livestock accounting for the county's largest source of cash receipts (BLM 2005). Livestock also accounts for the largest source of cash receipts in Duchesne County. Livestock grazing relies heavily on federal grazing allotments. The Vernal Field Office currently administers grazing on 146 allotments within the tri-county ROI. These allotments encompass

approximately 1,691,116 acres of BLM land and an additional 545,887 acres of private, state, tribal, and other federal lands (BLM 2005).

According to the Utah Department of Workforce Services (2004), the development of oil and gas resources is a predominant contributor to the economy of Uintah County and to a lesser extent in Duchesne County (government is the leading employment sector in Duchesne County). There is very little reliance on forestry or forestry products in the ROI. Other economic uses of public lands in the ROI include rights-of-way for utility corridors, roads, and pipelines.

3.3.18 WILD HORSES AND BURROS

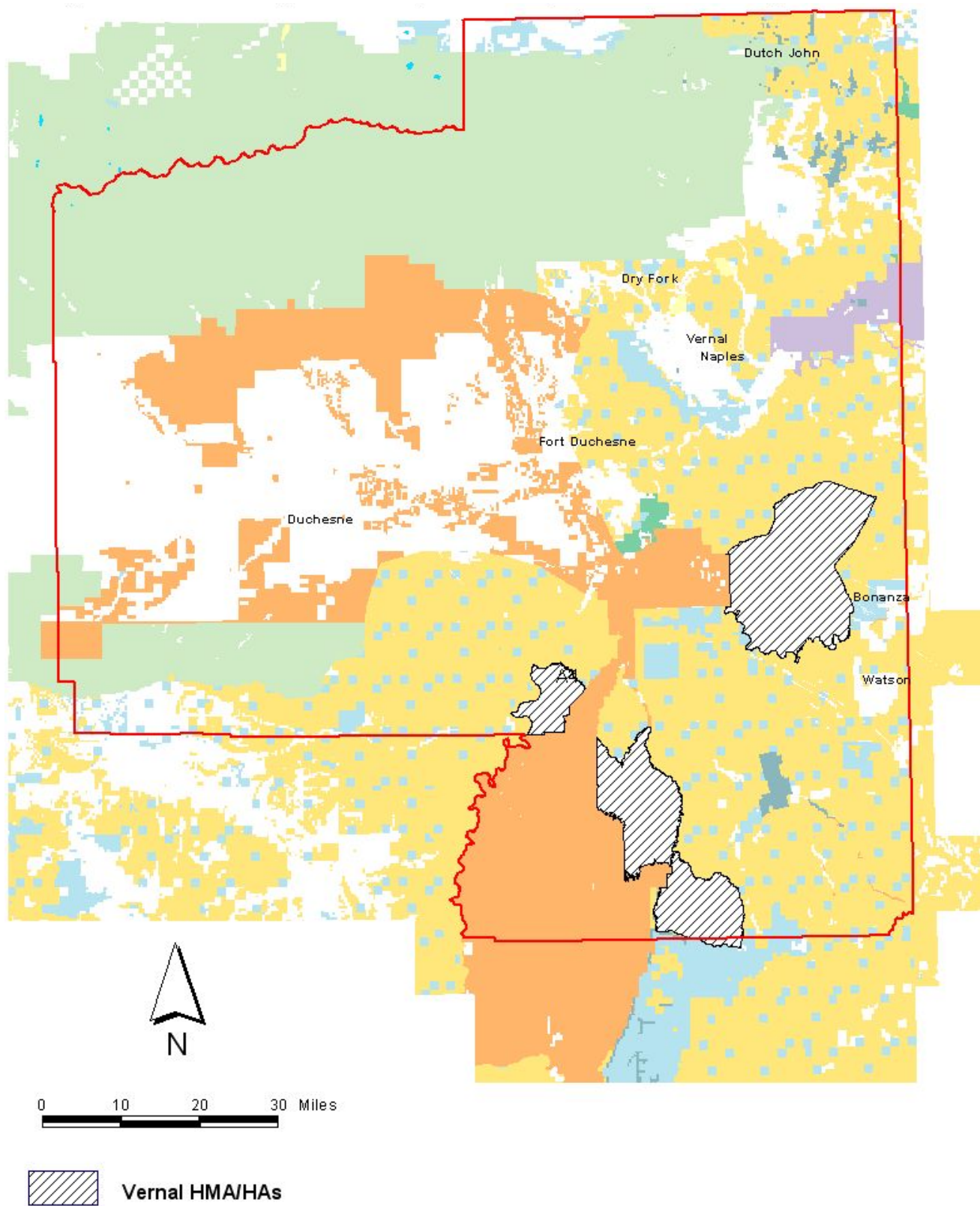
In 1971, Congress passed legislation to protect, manage, and control wild horses and burros on the public lands (Wild Horse 1971). The Wild Free-Roaming Horse and Burro Act declared these animals to be “living symbols of the historic and pioneer spirit of the West.” The Vernal planning area contains three herd management areas (HMA) and herd areas (HA). Current HMA/HA boundaries are shown in **Figure 3.7**. The appropriate management level for each HMA is presented in **Table 3.10**.

TABLE 3.10: HERD MANAGEMENT AREAS AND APPROPRIATE MANAGEMENT LEVELS FOR THE VERNAL PLANNING AREA

Herd Management Area (HMA)/Herd Area (HA) and BLM Acres	Appropriate Management Level		Current Estimated Population	
	Horses	Burros	Horses	Burros
Bonanza (HMA) (125,029 acres)	100	0	0	0
Hill Creek (HMA) (54,245 acres)	195	0	240	0
Winter Ridge (HA) (38,916 acres)	0	0	100	0
TOTAL ACREAGE	295	0	340	0

*The Vernal Field Office is in the process of updating herd management areas/herd areas.

FIGURE 3.7: HERD MANAGEMENT AREAS AND HERD AREAS IN THE VERNAL PLANNING AREA



3.3.19 WILDERNESS CHARACTERISTICS

Wilderness characteristics are defined as features of the land associated with the concept of wilderness (see Section 3.3.10, Wilderness Study Areas, for the definition of wilderness) that may be considered in land use planning when BLM determines that those characteristics are reasonably present, of sufficient value (condition, uniqueness, relevance, importance) and need (trend, risk), and are practical to manage (USDI 2003).

Lands with wilderness characteristics may be managed to protect and/or preserve some or all of those characteristics. This may include protecting certain lands in their natural condition and/or providing opportunities for solitude, or primitive and unconfined types of recreation (USDI 2003).

Non-WSA Lands with Wilderness Characteristics

Within the Vernal planning area, approximately 163,561 acres have wilderness characteristics. **Table 3.11** lists non-WSAs with wilderness characteristics and acreage. The 10 areas that have been identified as having wilderness characteristics within the Vernal planning area are shown on **Figure 3.8** (BLM 1999). The 1999 BLM Utah Wilderness Inventory and the 1999 BLM Utah Wilderness Inventory Revision Documents for the Vernal Field Office provide detailed descriptions of all of the wilderness character areas.

Non-WSA Lands Likely to Have Wilderness Characteristics

The public has submitted information to the Utah BLM suggesting that areas not previously identified in the Vernal planning area have wilderness characteristics. The BLM evaluated and assessed the information and determined that 10 areas, totaling 142,531 acres may have wilderness characteristics. These areas are shown on **Figure 3.8** and are listed in **Table 3.12**.

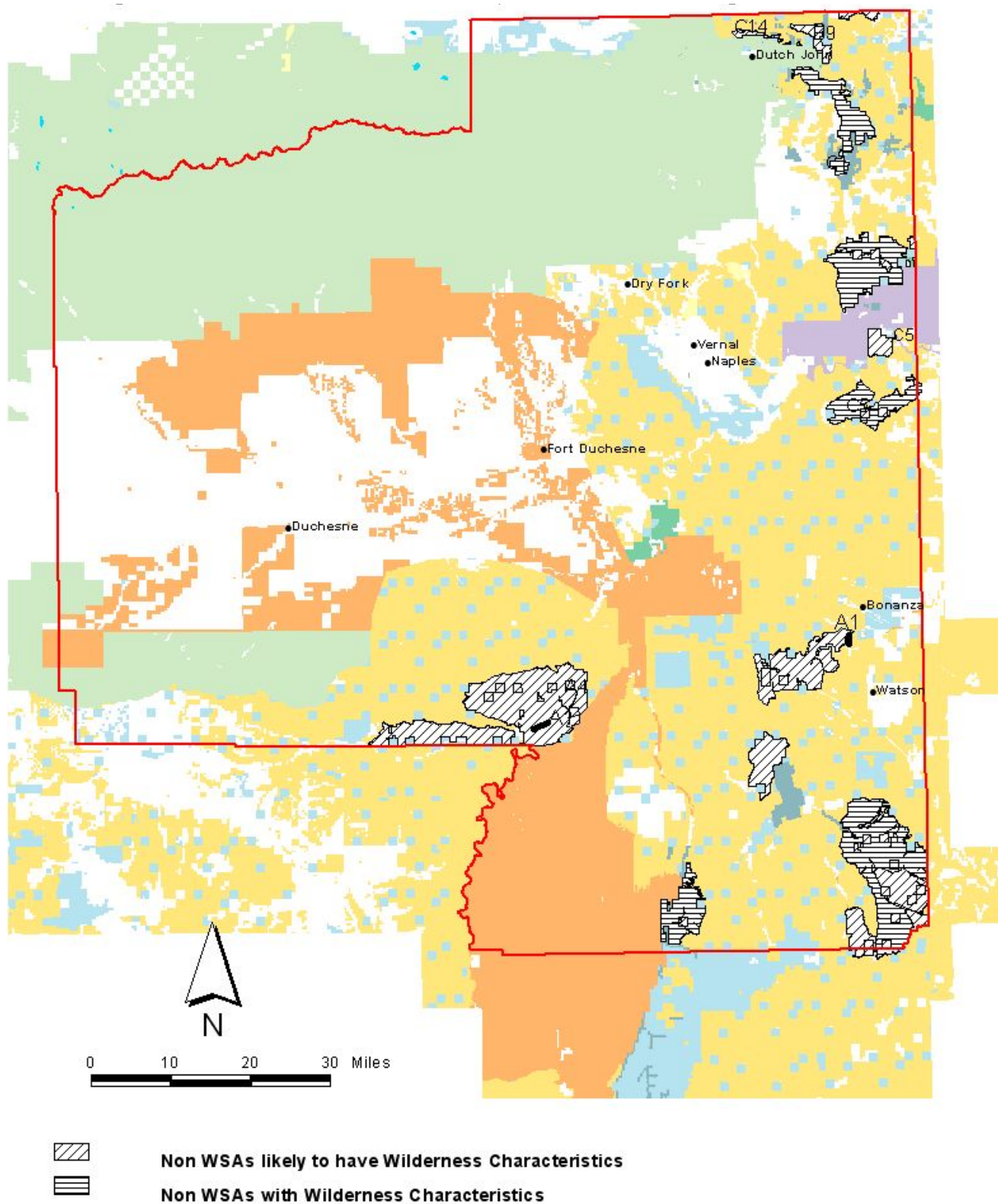
TABLE 3.11: NON-WILDERNESS STUDY AREAS WITH WILDERNESS CHARACTERISTICS

Name	Approx. Acreage
Book Cliffs Instant Study Area	399
Bull Canyon	2483
Cold Spring Mountain	12,582
Cripple Cowboy	12,574
Daniels Canyon	3984
Desolation Canyon	87,929
Diamond Breaks	5,344
Lower Bitter Creek	13,890
Moonshine Draw	3,837
White River	19,923
TOTAL ACREAGE	163,561

TABLE 3.12: NON-WILDERNESS STUDY AREAS LIKELY TO HAVE WILDERNESS CHARACTERISTICS

Name	Approx. Acreage
Bitter Creek	32,820
Bitter Creek/Rat Hole	11,140
Bourdette Draw	16,806
Desolation Canyon	11,330
Diamond Mountain	26,807
Lower Bitter Creek	11,550
Lower Flaming Gorge	17,835
Moonshine Draw	690
Sweet Water	6,456
White River	7,098
TOTAL ACREAGE	142,531

FIGURE 3.8: NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS AND NON-WSA LANDS LIKELY TO HAVE WILDERNESS CHARACTERISTICS IN THE VERNAL PLANNING AREA



CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter discloses the predicted direct, indirect, and cumulative effects of the alternatives described in Chapter 2 and **Appendices D and E**.

This chapter is organized with discussions of direct and indirect impacts on each resource under both the Proposed Action and No Action Alternative. The analyses of impacts of fire management actions on each resource are discussed in a short and long-term context. The cumulative effects section of this chapter (Section 4.4) analyzes the effects of past, present and reasonably foreseeable actions along with the effects of the Proposed Action and No Action Alternative.

To provide additional context in the analysis of impacts from fire management actions associated with both alternatives, a general description of fire's effects on each resource is presented as **Appendix H**. These effects are present in the environment regardless of what alternative is selected. The alternative selected would increase or decrease these effects and that difference forms the basis of the analysis of impacts.

Locations, geographic extent, and intensity of future FMP actions and wildfire events are not known. Therefore, the effects analysis is focused on impacts across the entire Vernal planning area and not on particular sites or FMUs. Additional environmental analyses for site-specific proposals would occur prior to implementation of management actions. The following assumptions were used in the effects analysis:

- The fire management actions that were analyzed for potential impacts on resources of concern are: (1) wildland fire suppression and related ESR actions, (2) wildland fire use, (3) prescribed fire, and (4) non-fire fuel treatments.
- Short term is defined as less than five years, and long-term is defined as fifteen+ years.
- The No Action Alternative's primary fire suppression objective is full suppression.
- If the Proposed Action were implemented, a measurable reduction in occurrence, severity, or size of wildfires would not be expected in the short term. The difference in impacts between the alternatives would be primarily in the long term.
- Wildland fire use is not included in the No Action Alternative.
- Prescribed burning is typically accomplished to benefit resources in the long term.
- Planned actions are implemented only in areas with a low risk of noxious weed infestation or when the action includes a component (e.g., seeding) to reduce the risk of infestation.
- Fuel treatments in the No Action Alternative would be less than in the Proposed Action.
- Chemical and biological treatments would occur on less than 5,000 acres over 10 years. Because these treatments would occur on such a small area, impacts from these treatments would occur in site-specific analysis and won't be covered in this EA.
- Seeding actions often follow wildland fire suppression (these are considered ESR actions), and sometimes occur in with prescribed fire and non-fire fuel treatments (mechanical, biological and chemical). Seeding actions would be implemented to stabilize soils, improve establishment of native grass, forb and shrub communities, and prevent establishment of non-native invasive species.

4.2 PROPOSED ACTION

4.2.1 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

The seven ACECs in the Vernal planning area include the Browns Park, Lears Canyon, Lower Green River, Nine Mile, Pariette Wetland, Red Creek, and Red Mountain-Dry Fork Complex ACECs. As shown in **Figure 4.1**, approximately 50 percent of ACEC lands are found within Category C FMUs. Approximately 22 percent of ACEC lands are found within Category A FMUs, 24 percent in Category B FMUs, and four percent in Category D FMUs. In all categories, management activities would be carried out in a manner that would minimize impacts to the values each ACEC was designated to protect. ACECs in the planning area have been designated to protect the following relevant and important values: cultural and historic resources, botanical resources including relict vegetation and riparian areas, fish and wildlife resources including endangered species, scenic areas, paleontologic resources, erodible areas, and watersheds.

Short-term Impacts

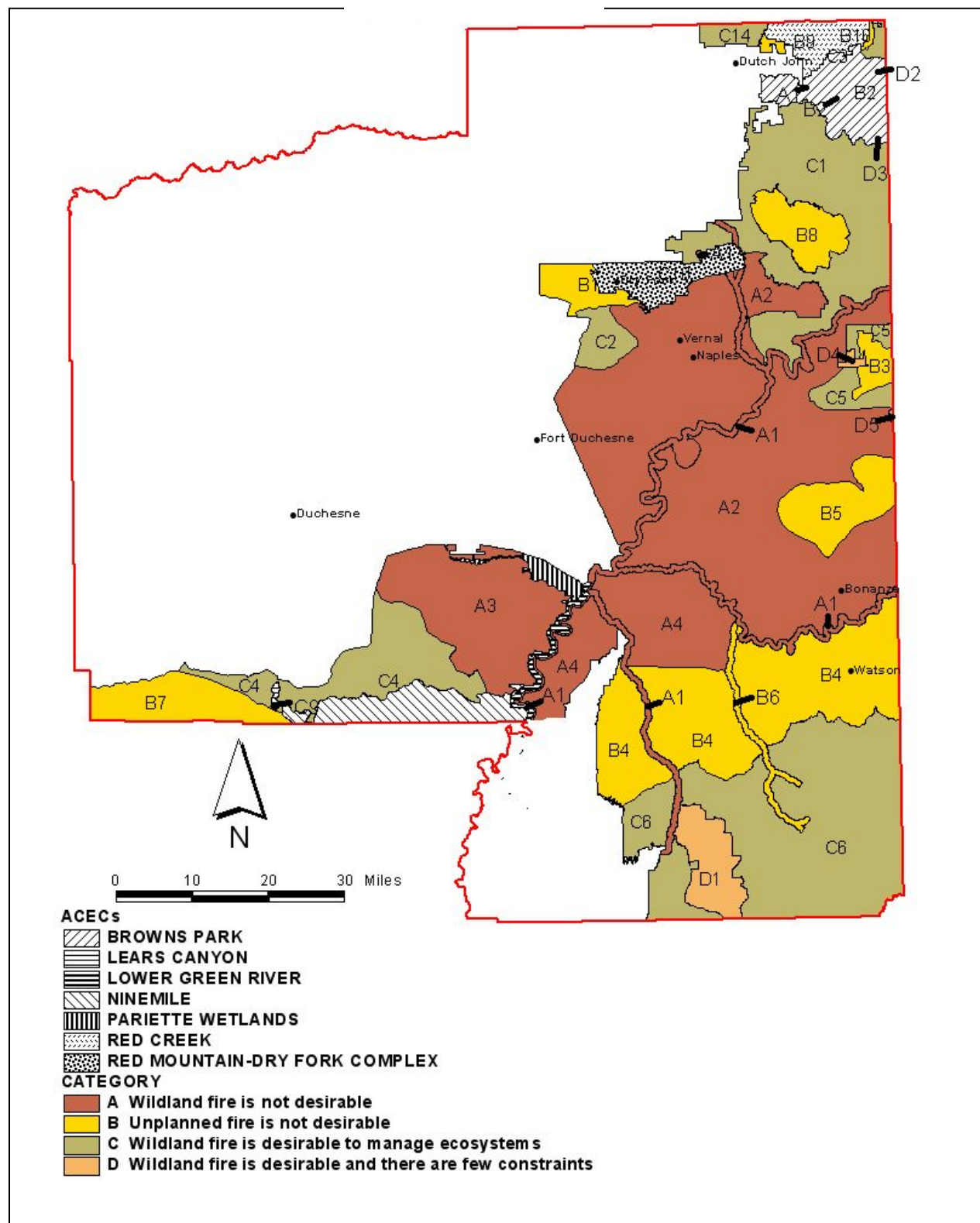
To minimize the impairment of values associated with all ACECs, RPMs have been built into the Proposed Action. These protection measures apply to resources (e.g., soil, vegetation, water, fish and wildlife, paleontology, and cultural resources) associated with ACECs. By following these measures, impacts to ACEC values would be reduced.

Short-term impacts on ACEC components could include disturbance to sensitive soils and watersheds, disturbance or loss of vegetation (including riparian areas or relict vegetation), damage to paleontologic resources, destruction of artifacts or integrity of cultural sites and resources, impairment of visual resources, and degradation or loss of habitat for fish and wildlife species (including threatened and endangered species). These impacts would be minimized by following management guidelines and implementing post-fire rehabilitation, and could be less adverse than impacts from allowing fires to burn naturally and harm historic, scenic, or cultural values of ACECs. Impacts to these physical resources are discussed in their respective sections including cultural resources, vegetation, wetlands and riparian zones, threatened and endangered species, and soils.

The AMR during a wildland fire would be applied to reduce potential impacts to the ACEC values, and could include procedures such as limiting the use of mechanical suppression activities, recommending smaller fire camps, or removing tracks and traces of fire suppression actions. ACECs found in Category A and B FMUs would be more likely to incur short-term impacts from suppression activities than ACECs found in Category C and D FMUs. These greater suppression efforts could affect ACEC components such as vegetation, habitat, and air quality. ESR actions (including seeding) would be implemented to stabilize areas that have been burned to minimize the threat of invasive and noxious weed establishment after wildfire and suppression activities. Suppression and ESR actions would consider ACEC values, and impacts would be avoided when possible (i.e., actions pose no threat to human health or safety, or other higher-priority resources). Therefore, they would not likely impact or impair those values that ACECs were designated to protect.

Prior to approval, all planned activities would undergo a site-specific environmental evaluation to determine potential impacts on ACEC values and impacts to those values would typically be avoided. Prescribed fire and non-fire fuel treatments would be implemented. These treatments would help maintain the naturalness of the ACECs by lowering FRCC to one that would be more consistent with a natural fire regime.

FIGURE 4.1: AREAS OF CRITICAL ENVIRONMENTAL CONCERN AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



Long-term Impacts

The Proposed Action would result in modification of the current vegetation condition to a DWFC that would more closely reflect historic conditions. Long-term impacts associated with the proposed action is a decreased risk of severe wildland fire. Together, removal of hazardous fuels and a reduced risk of severe wildland fire would benefit ACECs by providing long term protection to relevant and important values including cultural resources, relic vegetation, and riparian resources. However, it is possible that some relevant and important values, such as cultural sites or artifacts, could be inadvertently and permanently lost by some fire management actions. Since it is not possible to restore those resources, the designation of an ACEC could be permanently affected. This would be unlikely however, since resource protection measures, and laws and regulations typically protect such values that are at risk of being permanently destroyed (i.e., cultural or paleontological resources).

4.2.2 CULTURAL RESOURCES

Short-term Impacts

Direct effects of fire suppression efforts including ESR actions, prescribed fire, and non-fire treatments could impact the thousands of cultural resource sites on BLM-administered lands within the Vernal planning area. Cultural resources include archaeological, historic, and architectural sites that are important for scientific research, preservation, and interpretation. RPMs incorporated into the Proposed Action, such as pre-treatment surveys and subsequent avoidance as well as the Utah State Protocol Agreement 3-7-01, should minimize these effects. Because not all cultural resources are easily detectable or avoidable, the potential for impacts on cultural resources, particularly historic properties, does exist throughout the Vernal planning area.

Often, cultural resources are at greater risk of impacts from fire suppression activities than from the wildland fire itself. Suppression efforts (e.g., establishment of firelines, helicopter bases, safety zones, and fire camps), may be ground-disturbing and could destroy artifacts and the integrity of cultural resource sites. Water, foam detergents, and fire retardants could damage artifacts and features by causing swelling and subsequent contraction. Other potential short-term impacts would include rapid cooling and subsequent damage (e.g., breakage, spalling, corrosion, staining, rusting) of archaeological materials. Discoloration or warping of metallic surfaces could also occur. Rock art is particularly sensitive to retardants. For all wildland fires or prescribed fires, post-fire vandalism and artifact collection could occur.

In contrast to the current wildland fire management direction, the Proposed Action would decrease the impact on cultural resources through its emphasis on resource protection. These protections are incorporated into the Proposed Action through RPMs. Minimal differences in fire severity would be expected between the Proposed Action and No Action Alternative. However, the Proposed Action will allow more wildfire through wildland fire use acres. Historic-aged resources would be more susceptible to impacts from wildland fire relative to prehistoric-aged resources (SHPO 2005) under the Proposed Action. Consultation with a cultural resource specialist during suppression and ESR activities in areas containing sensitive cultural resources should help to minimize impacts.

ESR actions and other planned actions with the potential to affect cultural resources are subject to the requirements of Section 106 of NHPA, as amended (36 CFR 800, consultation with the Utah State Historic Preservation Officer). Areas potentially affected by surface disturbance would be subject to a cultural resource inventory, including a review for traditional cultural properties. Inventories would lower the potential for impacts on cultural resources by identifying the location of those sites and allowing for their avoidance.

Wildland fire use has the potential to have impacts on cultural resources. Impacts are minimized through the utilization of wildland fire use in areas where important cultural or historic resources are not present or have a small potential to be impacted and where lower temperatures and durations of fire are expected. Following RPMs for wildland fire use would greatly reduce the potential for impacts to cultural resources.

Prescribed fire and non-fire fuels reduction treatments can directly impact cultural resources, depending upon their location and type. Ground-disturbing treatments (e.g., brush crunching) are more likely to impact cultural resources than are chemical treatments. The potential for proposed prescribed fire, non-fire fuel treatments, and seeding actions to impact cultural resources would be considered during all phases of planning and implementation on a project-by-project basis. The most commonly selected method for the management of cultural resources located in an area of potential effect is complete avoidance of known resources. Because of the effectiveness of site-specific planning, the potential for impacts on cultural resources is considered negligible to minor for prescribed fire and non-fire fuel treatments.

Long-term Impacts

The continued trend toward a decrease in fuel loads would decrease severe fires. This would decrease the level of suppression required on an average wildland fire. A decrease in the impact on cultural resources from ground-disturbing, non-fire fuel treatments, or suppression activities would be realized in the long term. Heat and duration-related impacts would be similarly reduced over time.

Prescribed fires typically burn at a lower temperature and duration than large wildfire events, therefore the potential impacts would typically have less long-term impacts than those from an unmanaged wildland fire event. This advantage would continue as more vegetation is brought to a FRCC that supports the reintroduction of fire as a natural process. The long-term impact under the Proposed Action would be the protection of cultural resources that would be more susceptible to damage or destruction under the No Action Alternative.

4.2.3 FLOODPLAINS

Effects of fire management activities on floodplain resources are also closely associated with effects to soil, water, and wetlands and riparian resources as discussed below and in their respective resource sections.

Short-term Impacts

RPMs have been built into the Proposed Action to protect floodplain resources. These measures would be implemented during wildland fire suppression activities and ESR, wildland fire use, prescribed fire, and non-fire fuel treatments and would limit and minimize potential impacts, such as loss of stream channel stability and increased erosion due to vegetation loss.

Figure 4.2 presents the location of mapped floodplains located in the Vernal planning area with FMUs categorized by relative desirability of wildland fire (Categories A through D). Under the Proposed Action, several FMUs where fire has been determined to be desirable (Categories C and D) contain floodplain areas (including those associated with the Willow Creek and Bitter Creek drainages in the southeast corner of the Vernal planning area and the Matt Warner and Calder Reservoirs in the northeast corner of the Vernal planning area). Impacts to floodplain resources in these areas would be mitigated through use of AMRs, resource protections measures, and conformance to existing guidelines (EO 11988).

Long-term Impacts

The Proposed Action would allow more flexibility than the No Action Alternative in wildland fire response and in implementing planned actions that would protect and enhance floodplains. Over time, as fire returns

to a more natural pattern, there would be fewer indirect impacts from large, severe wildfires including sedimentation of streams and reservoirs from wind and water erosion.

A trend towards fewer severe wildfires would increase soil stability and would enhance overall bank and channel stability and PFC of the watershed. Floodplains would have fewer disturbances from severe wildfires, which would allow greater stability and increased functionality of floodplains, including decreasing the impact of flashfloods.

4.2.4 INVASIVE, NON-NATIVE SPECIES

Short-term Impacts

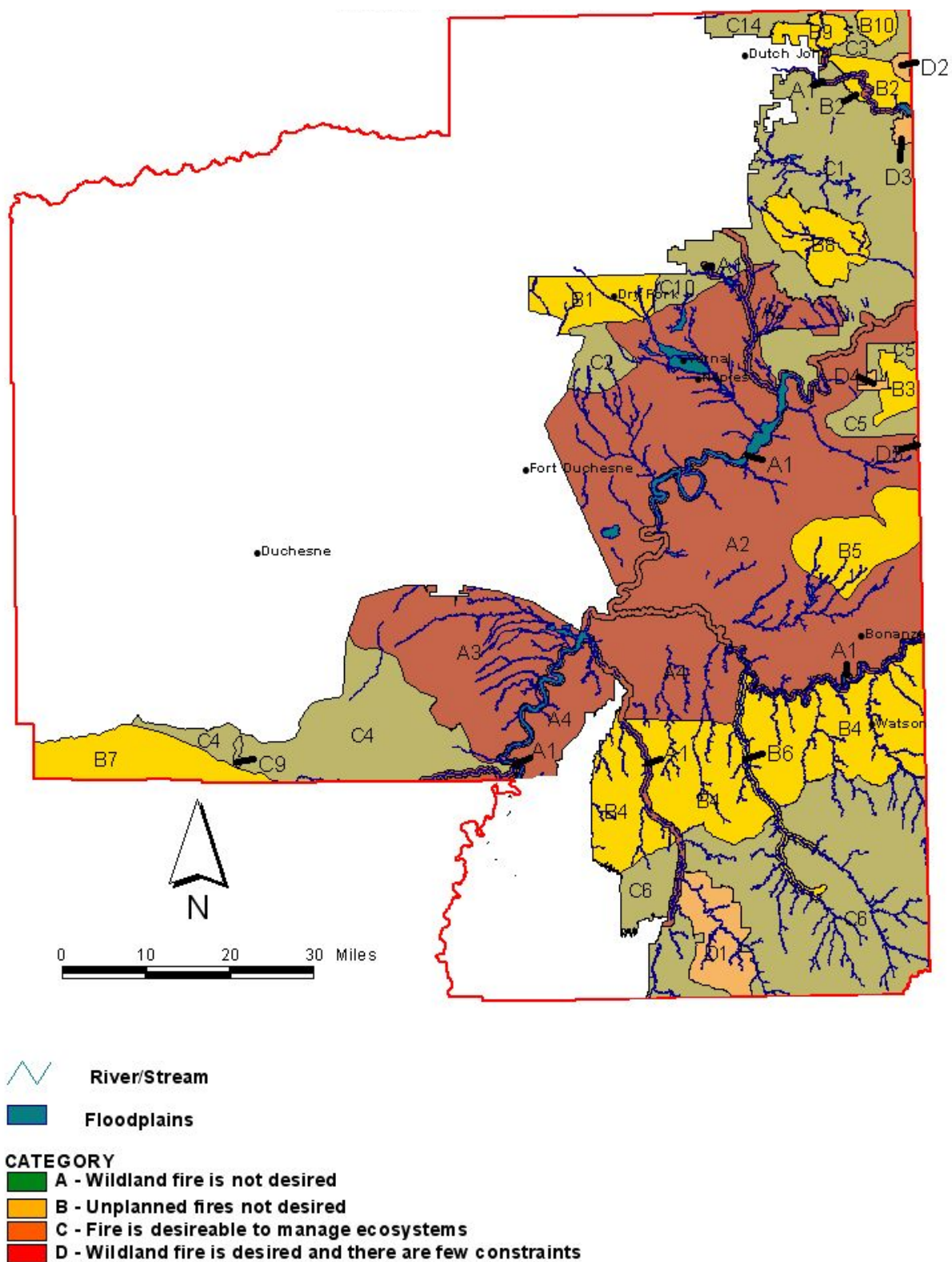
Invasive and noxious weed populations often increase after wildfires as seeds germinate following the flush of nutrients and lack of competition. Aggressive seeding, rehabilitation, monitoring, and weed treatment after wildfire events would help minimize the impact from weed invasion after a wildfire. Because wildland fire use would only occur in areas where a low potential for noxious and invasive weed occurrence and spread exists, impacts on the spread of noxious and invasive weeds would be minimal.

Prescribed fire and non-fire treatments would be planned to aid in removal of noxious and invasive weeds. In some cases where weeds have been identified as an issue, seeding would occur with planned fire and non-fire fuel treatments. Under the Proposed Action, the spread of invasive and noxious weeds using these types of actions would be minimal and/or chemical treatments would follow planned fire and non-fire fuel treatments.

Long-term Impacts

The appropriate application of wildland fire use, prescribed fire, and non-fire fuel treatments along with aggressive ESR treatments following undesired wildfires would lower the potential for post-fire weed establishment and infestations. Reduction of severe wildland fires over time would result in less potential for vegetation conversion to noxious weeds or exotic annual grasses.

FIGURE 4.2: HUNDRED-YEAR FLOODPLAINS AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



4.2.5 NATIVE AMERICAN RELIGIOUS CONCERNS

Short-term Impacts

Often, the facets of a landscape valued in Native American religious beliefs and practices are at greater risk of impacts from fire suppression activities than from the wildland fire itself. Suppression efforts (e.g., establishment of firelines, helicopter bases, safety zones, and fire camps), may be ground-disturbing and could impact the integrity of sites and vegetation used by Native Americans in their current religious practices and places of traditional cultural importance.

In contrast to the current management direction, the Proposed Action would have less aggressive wildland fire suppression. A resultant decrease in the potential to impact Native American religious concerns through ground-disturbing and other suppression activities would be realized. The decrease in suppression efforts may lead to a short-term increase in fire size and would result in a larger area of potential vegetation use areas and religious sites exposed to wildfires and associated impacts. Many areas used traditionally for hunting would be expected to be revegetated following a wildfire event. In localities where food, medicinal, or raw plant materials are gathered, the threat of invasive species occupying those areas would be a concern. ESR actions would reduce potential for these impacts.

Wildland fire use would be used only in areas where negative impacts to resources are minimized. Ground-disturbing actions (including seeding) are not associated with wildland fire use, thereby eliminating the potential for associated impacts.

Impacts from prescribed fire and non-fire fuel treatments would be minor because these actions are planned, and appropriate Native American consultation would occur to minimize potential impacts. Potential impacts to Native American religious concerns are considered during all phases of planning and implementation on a project-by-project basis, thereby minimizing the potential for impacts.

Long-term Impacts

The trend toward a decrease in fuel loads would decrease the number of large, severe fires. This would decrease the level of suppression required on an average wildfire. A decrease in the need to suppress fires to protect resources would reduce impacts to Native American religious concerns from ground-disturbing and other suppression activities. Potential for heat and duration-related impacts would be similarly reduced over time.

Wildland fire use may result in landscape level burns and associated impacts. However, those impacts would emulate impacts from natural processes that have been interacting with Native American historic religious experiences and sites. As vegetation trends toward a lower FRCC and toward DWFC, opportunities may exist to expand wildland fire use.

Consultation with Native American tribes would be conducted when planning treatments minimizing potential for long-term impacts. Wildland fire use, prescribed fire and non-fire fuel treatments may result in long-term beneficial effects for places of traditional cultural importance by returning native vegetation to a condition more historically representative.

4.2.6 SPECIAL STATUS SPECIES

Short-term Impacts

ESA-related Species

In accordance with Section 7(a) 2 of the ESA of 1973, as amended, the Utah BLM State Office engaged in formal Section 7 consultation with the USFWS. This process involved preparing a BA that included impact analyses and subsequent determinations for all federally listed and proposed species, and considered potential project-related effects (direct and indirect) to each species and their habitat (including those areas designated as critical habitat) from the fire management actions presented in the Vernal Proposed Action. The Proposed Action would follow the RPMs identified in **Appendix E**. In addition, the Biological Opinion (BO) identified terms and conditions that would reduce impacts to ESA-related species (see **Appendix I**).

Allowable effects determinations within the biological assessment include May Affect, Not Likely to Adversely Affect (NLAA); May Affect, Likely to Adversely Affect (LAA); and Not Contribute to Federal Listing (NCL). Each determination was based on a combined analysis of potential effects from the LUP EA Proposed Action and the five FMP EA Proposed Actions (Salt Lake, Vernal, Moab, Southern Utah Support Center, and Richfield). For any species with designated or proposed critical habitat, determination of effects to that habitat was combined with determination of effects to the species. In this EA, only the determinations for each species that are known to occur within, or has potential to occur within, the Vernal planning area will be presented. Determinations take into consideration potential short-term, long-term, and cumulative impacts from wildland fire suppression (including ESR), wildland fire use, prescribed fire, and non-fire fuel treatments.

Eleven species were given a determination of LAA and four species were given a determination of NCL. No species within the Vernal planning area were given a determination of NLAA. The 11 species given a determination of LAA include the black-footed ferret, Canada lynx, bald eagle, Mexican spotted owl, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, humpback chub, bonytail chub, Colorado pikeminnow, and razorback sucker. Designated critical habitats have been finalized (and effects to them analyzed) for the Mexican spotted owl, humpback chub, bonytail chub, Colorado pikeminnow, and razorback sucker. The four species that were given a determination of NCL include the following candidate or petitioned species: the western yellow-billed cuckoo, horseshoe milk-vetch, Graham's beardtongue, and White River beardtongue. Only one species, Clay reed-mustard, was given a determination of NLAA. For detailed discussion on the effects determinations for each ESA-related species and the two BLM sensitive species that were included in the BA, refer to the BA and BO associated with this project.

Additional consultation with the USFWS would be required for all implementation-level fire management activities if they would occur within suitable or potentially suitable habitat for federally listed species. The Alternative Consultation Agreement to Implement Section 7 Counterpart Regulations could be employed for consultation on projects that support the National Fire Plan.

BLM Sensitive Species

In addition to RPMs designed to protect ESA-related species and their habitat, RPMs to protect BLM sensitive species have been designed and built into the Proposed Action.

General Short-term Effects on ESA-related and BLM Sensitive Species

Some of the goals of the Proposed Action are to restore historical habitats and native plant species, and to enhance, maintain, and protect ecological resources. These goals would be accomplished through implementation of ESR, fuels reduction, allowing fire to play its ecological role, and seeding activities. The

potential for short-term adverse impacts would be offset by long-term beneficial effects of rehabilitation activities (built into the Proposed Action for soil disturbing activities), protected ecological resources (remaining after a suppression event), and reduction of fuels (following implementation of wildland fire use, prescribed fire, or a non-fire fuel treatment). The subsequent, gradual return to a more natural fire regime would result in long-term beneficial effects to species and habitat.

Despite varied life histories and habitat requirements of each SSS, some potential short-term effects can be generalized based on the types of fire management activities being proposed and general ecological principles. The items presented below include potential residual (general) impacts that could occur following implementation of the Proposed Action (including RPMs and BO Terms and Conditions). RPMs and BO Terms and Conditions are typically designed to minimize effects (particularly from pre-planned fire management activities such as prescribed fire and non-fire fuel treatments) and prevent them from becoming long-term.

Wildland fire suppression has the highest potential for negative effects on SSS because of the emergency nature of suppression actions that sometimes require quick response without detailed, site-specific data or analysis. In some cases, RPMs may not necessarily be fully implemented due to risks to firefighter or public safety. Wildland fire use and prescribed fire could have similar short-term effects as wildland fire suppression. However, because of the application of RPMs and the more planned nature of these actions, short-term effects from wildland fire use and prescribed fire would be reduced compared to wildfire suppression. Similar effects could also occur from non-fire fuel treatments, but because these actions follow precise and predictable application methods, impacts would be further reduced compared to wildland fire use and prescribed fire.

Short-term impacts from the proposed action include the following:

- Visual or auditory disturbance or displacement of individuals (affecting foraging, roosting, and/or reproductive behavior) from vehicles, heavy equipment, firefighters, and low-flying aircraft.
- Mortality or injury of adults, young, or eggs from smoke inhalation during burning operations, or from vehicles or equipment.
- Mortality of adults, young, or larvae of aquatic species from using occupied water sources.
- Nest/den abandonment or mortality of young or eggs.
- Injury or mortality due to inadvertent strikes during aerial drops of fire retardant.
- Illness or mortality due to inadvertent chemical contamination of terrestrial or aquatic species' habitats during aerial applications of fire retardant.
- Heat stress or mortality to special status plants.
- Crushing of special status plants, resulting in damage or mortality, from human foot traffic or use of vehicles or heavy equipment.
- Damage seedbanks of special status plants from severe fire or mechanical disruption.
- Removal of key habitat components for nesting, denning, foraging, roosting, or cover due to equipment use or operational tactics, including the following:
 - Snag removal for safety reasons.
 - Tree and shrub removal and associated soil disturbance during fireline construction (or other fire support construction) and fuel treatments.
 - Decreased water quantity for aquatic species from dewatering during low flow periods.

- Damage or loss of riparian or upland vegetation or downed woody debris, and increased surface run-off resulting in the following:
 - Decreased channel stability and alteration of channel morphology.
 - Increased erosion, sediment, and ash levels within and adjacent to the stream channel.
 - Increased water temperatures.
 - Degraded water quality (based on nutrient levels, temperature, and sediment levels).
 - Reduced riparian habitat, in-stream habitat cover, and woody debris that is typically necessary for properly functioning riparian areas and aquatic habitat.
 - Altered water velocities and substrate composition.
 - Altered composition and decreased abundance of aquatic and terrestrial food sources.
- Increased risk of predation from removal of cover.
- Changes in foraging habitats and/or food and prey quality and quantity.
- Spread of disease or non-native, predatory species within previously uninfected water sources.
- Soil erosion of special status plant habitat.
- An increase in invasive plant species that could out-compete special status plant species.

Short-term Effects on ESA-related and BLM Sensitive Species Habitat

SSS are known to have suitable habitat and are known to occur within all vegetation types within the Vernal planning area. Habitat for these species would be vulnerable to any of the impacts discussed in Section 4.2.3 (Vegetation). Although fire management activities would vary among vegetation communities, they could affect species and species habitat to varying degrees within all of the vegetation/habitat types. Three of the habitat types within the Vernal planning area (pinyon and juniper woodland, mountain shrub, and sagebrush) would be proposed for more acres of wildland fire use, prescribed fire, and non-fire fuel treatments than all other habitat types combined.

The majority of acres designated as Category C or D lands are comprised of mountain shrub, pinyon and juniper woodland, or sagebrush habitat. Therefore, species found in each of these habitats would be more likely to incur impacts from larger fires (resulting from less aggressive wildland fire suppression and wildland fire use), be they adverse or beneficial, than species found in the remaining habitat types. Because species occurrence records do not account for areas that have not been surveyed, unknown individuals or populations of a particular species may exist within any of these vegetation communities. RPMs and BO Terms and Conditions that would address unknown populations and areas of potentially suitable habitat have been incorporated into the Proposed Action.

Changes in vegetation structure and composition can alter the quality and quantity of various habitats for federally protected species that occupy them. For impacts analyses to SSS, the baseline for each species is not a condition of “no wildland fires,” but rather the current condition of the vegetation communities in which the species live and the current risk of severe wildland fire (as described in Section 3.3.13). That current condition, in turn, provides the basis for analysis of the Proposed Action. The list of habitat associations in Chapter 3 of this EA links the SSS that may be affected by the Proposed Action with each vegetation community.

In the following discussion, please refer to the list of specific effects, above, related to the specific actions that would occur.

Salt Desert Shrub: Species found within salt desert shrub habitat would be less likely than those found in some other habitats to incur short-term impacts from wildland fire (including wildfire, wildland fire use, and prescribed fire) since these actions are not targeted for salt desert shrub. Habitats would benefit from aggressive ESR actions following wildfire. Impacts from fuel treatments would be reduced through site-specific consideration of impacts to SSS. Additionally, this habitat is not particularly targeted for planned vegetation treatments.

Pinyon and Juniper Woodland, Sagebrush, Grassland: Species found within these habitats would be more likely than those found in some other habitats to incur short-term project-related impacts because this habitat is relatively far removed from its natural fire regime. These habitats would be targeted for vegetation treatments resulting in habitat modifications. Short-term impacts from habitat modification could result in species mortality, temporary displacement, or habitat destruction.

Mountain Shrub, Mixed Conifer, Ponderosa Pine, Aspen: Species found within these habitats could incur short-term project-related impacts from fire management actions designed to maintain or lower the current FRCC. Short-term impacts to mountain shrub-dependent species could include mortality, temporary displacement, and habitat destruction.

Riparian and Wetland, and Water: Direct effects from wildland fire suppression could include the following: introduction of fire retardant, aviation fuel, or lubricants into streams and wetlands; erosion of exposed soils from fireline construction on steep slopes adjacent to streams; damaged riparian vegetation and soils (resulting in erosion) from the use of heavy equipment; and reduced natural stream flow during drafting and pumping. These impacts would adversely impact water quality of various fisheries throughout the Vernal planning area. The collective short-term impacts of increased sedimentation (from erosion) could have watershed-wide effects including changes in temperature, turbidity, and water chemistry. However, RPMs and BO Terms and Conditions that were developed for riparian and wetland habitat and specific SSS would minimize the potential for short-term adverse impacts to aquatic species and their habitat.

Additionally, because RPMs would limit acres of prescribed fire and would impose constraints on non-fire fuel treatments in and adjacent to riparian and wetland and water habitats, short-term adverse impacts from these fire management activities would be minimized or eliminated.

Long-term Impacts

General Long-term Effects on ESA-related and BLM Sensitive Species

With suppression being implemented only where unplanned wildfire is not desired, and wildland fire use, prescribed fire, and non-fire fuel treatments being used to minimize fuel loading, vegetation communities, and wildlife habitats would transition over time to more closely reflect conditions associated with a habitat's natural fire regime. This would create a more balanced (diverse) and stable ecosystem that would have a reduced threat of severe wildland fire. Mortality or long-term displacement of species would likely be avoided because wildland fire use and prescribed fire would not consist of large fires, relative to uncontrolled wildfires. If management activities were implemented repeatedly within the same treatment area (e.g., mechanical treatment followed by prescribed fire followed by chemical treatment), populations could be displaced over the long-term. However, to the extent that suitable habitat were available nearby, these impacts would be offset by the beneficial reinstatement of habitat conditions consistent with a natural fire regime.

Federally protected species and their designated critical habitat could benefit from wildland fire suppression actions that would prevent the loss of designated critical habitat or suitable habitat from severe wildland fires. Federally protected species and their designated critical habitat could experience positive effects from post-fire ESR efforts. Long-term adverse impacts on federally protected species and their designated critical

habitat could occur from inadvertent mortality of individuals or long-term changes (alteration, removal, damage, or fragmentation) to suitable habitat components.

For many species, long-term negative effects would be greater from wildland fire itself, rather than from wildland fire suppression operations. For situations where extensive or aggressive fire suppression would be appropriate, or when species or habitat components would have a long recovery rate, long-term negative effects could occur. For example, short-term effects could become long-term effects when a species has relatively few individuals, is extremely localized, is specialized in its habitat, or has a slow reproductive rate. Furthermore, direct mortality of individuals in small or endemic populations or alteration of potentially suitable habitat could cause long-term negative effects. Because wildland fire management actions are typically localized, even under extreme conditions, actions would generally not affect wide-ranging species in the long term, unless they have a low reproductive rate.

Long-term impacts on key habitat components that could affect the ability of a federally protected species to continue occupying a site, could include the following:

- Damage, removal, or fragmentation of nesting, roosting, foraging, dispersal, or cover habitats for terrestrial wildlife (particularly in pinyon and juniper woodland, mixed forest, or sagebrush habitats).
- Long-term changes in water quality or quantity; removal of riparian or upland vegetation, or downed woody debris; increased surface run-off; or introductions of disease or non-native, predatory species (in reference to fish and other aquatic species and their habitats).
- Extensive or severe damage to seedbanks, substrates, vegetative composition, or structure of habitats for plant species.
- Long-term changes in prey populations when key habitat components are slow to recover.
- An increase in invasive plant species that could out-compete federally protected plant species or alter sensitive (or non-fire adapted) habitats of terrestrial wildlife species following fire suppression. RPMs or ESR activities would typically mitigate this potential effect to prevent it from becoming a long-term impact.

Site-specific planning would typically prevent mortality of individual species during prescribed fire and non-fire fuel treatment activities. Additionally, identification of areas suitable for wildland fire use would prevent mortality of individual species. These actions would minimize or prevent alteration of, damage to, removal of, or fragmentation of key habitat components within designated critical habitat or suitable habitats for SSS. Thus, negative long-term effects to species or suitable habitat would generally be avoided or limited in scope and/or intensity.

Conversely, if key habitat components were targeted for permanent change in structure or composition by fire management or resource objectives (e.g., restoration of altered habitats or historical fire regimes), long-term effects could be negative or beneficial for a species, depending on its particular habitat needs. Long-term effects could occur from wildland fire use, prescribed fire, or non-fire fuel treatment. For example, short-term effects could become long-term effects when a species has relatively few individuals, is extremely localized, is specialized in its habitat, or has a slow reproductive rate. Furthermore, direct mortality of individuals in small or endemic populations or alteration of potentially suitable habitat could cause long-term negative effects. Because wildland fire use and prescribed fires are typically localized compared to overall habitat availability, this activity would generally not affect wide-ranging species in the long term, unless they have a low reproductive rate.

Long-term impacts on key habitat components from wildland fire use and prescribed fire are the same as those listed above for wildland fire suppression. Long-term beneficial effects to species could result from the following:

- Decreased risk for large, severe fire events through fuels reduction and the gradual transition to a more natural fire regime.
- Restoration of habitats that have been altered by invasion of non-native species, or long-term exclusion of fire (in fire-adapted vegetation communities).

Long-term beneficial effects could potentially benefit species' reproduction, numbers, or distribution, facilitating the return of a species to its historic range (in some cases).

Long-term Effects on ESA-related and BLM Sensitive Species Habitat

Salt Desert Shrub, Pinyon and Juniper Woodland, Grassland, Mixed Conifer, Riparian and Wetland :

Long-term impacts would include a beneficial stabilization of the ecosystem, with a decreased risk of severe fire.

Sagebrush: Long-term impacts would include expanded acreage of both high and low elevation sagebrush (from removal of pinyon and juniper woodland and pinyon and juniper encroachment) and an overall transition to a lower FRCC within both low- and high-elevation sagebrush habitats. Because this transition would indicate a lower risk for severe wildfire, these impacts would be beneficial to species associated with sagebrush habitats.

Mountain Shrub: Long-term impacts to mountain shrub habitat and its associated species would be beneficial. Wildland fire use, prescribed fire, and non-fire fuel treatments would begin to restore a more diverse mountain shrub ecosystem, trending it toward a lower FRCC with lower risk for severe wildfire and the removal of both pinyon and juniper woodland and Douglas fir encroachment.

Ponderosa Pine: Since long-term effects would eventually produce a more stable ecosystem with a lower FRCC, maintenance of habitat size and a lower risk of severe wildland fire (e.g. limiting pinyon and juniper woodland encroachment), would result. These impacts would be beneficial to ponderosa pine habitats and the species associated with them.

Aspen: Fire management actions would serve to lower the existing FRCC and, subsequently, reduce the risk of a severe wildland fire. Additionally, fire management actions within mixed conifer habitat could increase the aspen component. Collectively, fire management actions within mixed conifer and aspen habitats could increase overall aspen habitat throughout the Vernal planning area. These impacts would be beneficial to some SSS and the aspen habitats with which they are associated.

Water: Long-term impacts to water and aquatic inhabitants would be beneficial. With a reduced risk for severe wildland fire in upstream and adjacent habitats, the ecosystems would be less likely to incur such large-scale adverse impacts from fire as to decimate any entire aquatic populations.

4.2.7 WATER QUALITY

Short-term Impacts

Surface Water

Under the Proposed Action, the potential increase in wildland fire acres (including wildland fire use) and use of prescribed fire and non-fire fuel treatments could increase runoff, erosion, and stream temperatures. Possible increases in erosion and runoff would increase nutrient concentration and turbidity.

Water quality impacts associated with prescribed fire and non-fire fuel treatments actions would be evaluated through an environmental planning and review process that would minimize impacts related to

increases in surface runoff, soil loss, and sediment input to surface waters. Often these impacts are short-term and conditions return to pre-fire levels once vegetation is re-established.

Figure 4.3 presents the location of 303(d)-listed waterbodies located in the Vernal planning area relative to FMUs. Waterbodies are categorized by relative desirability of wildland fire in the FMU (Categories A through D). Most of the impaired 303(d)-listed waters in the Vernal planning area are not located on BLM-administered land. Those that are located on BLM-administered land are primarily located in FMUs where wildland fire is generally not considered desirable (Categories A and B). The Proposed Action would have minimal impacts on impaired waters through implementation following regulations for restoring or maintaining the restoration of water quality impaired [303(d) listed] waterbodies. Proposed RPMs would restrict activities in the vicinity of sensitive areas such as impaired waterbodies (i.e. 303(d)-listed) and municipal watersheds in order to reduce further degradation of surface water conditions.

Groundwater

Minor impacts on groundwater quality due to the Proposed Action are possible due to altered water absorption patterns from a decrease in vegetation cover following wildfire or fuel treatments and from soil compaction due to mechanical equipment. Additionally, infiltration could temporarily decrease after a fire due to the formation of a hydrophobic soil layer. Altered water infiltration rates could also temporarily increase or decrease the chemical levels (i.e., dissolved solids) in the shallow aquifer (Gee et al. 1992, Allison et al. 1994). The impact to groundwater would be dependent on the depth to groundwater below ground surface and the type of sediments or bedrock it passes through. The change in the infiltration capacity of the soil would be dependent on the fire severity, soil type, and vegetation's ability to reoccupy a site following fire.

Long-term Impacts

Surface Water

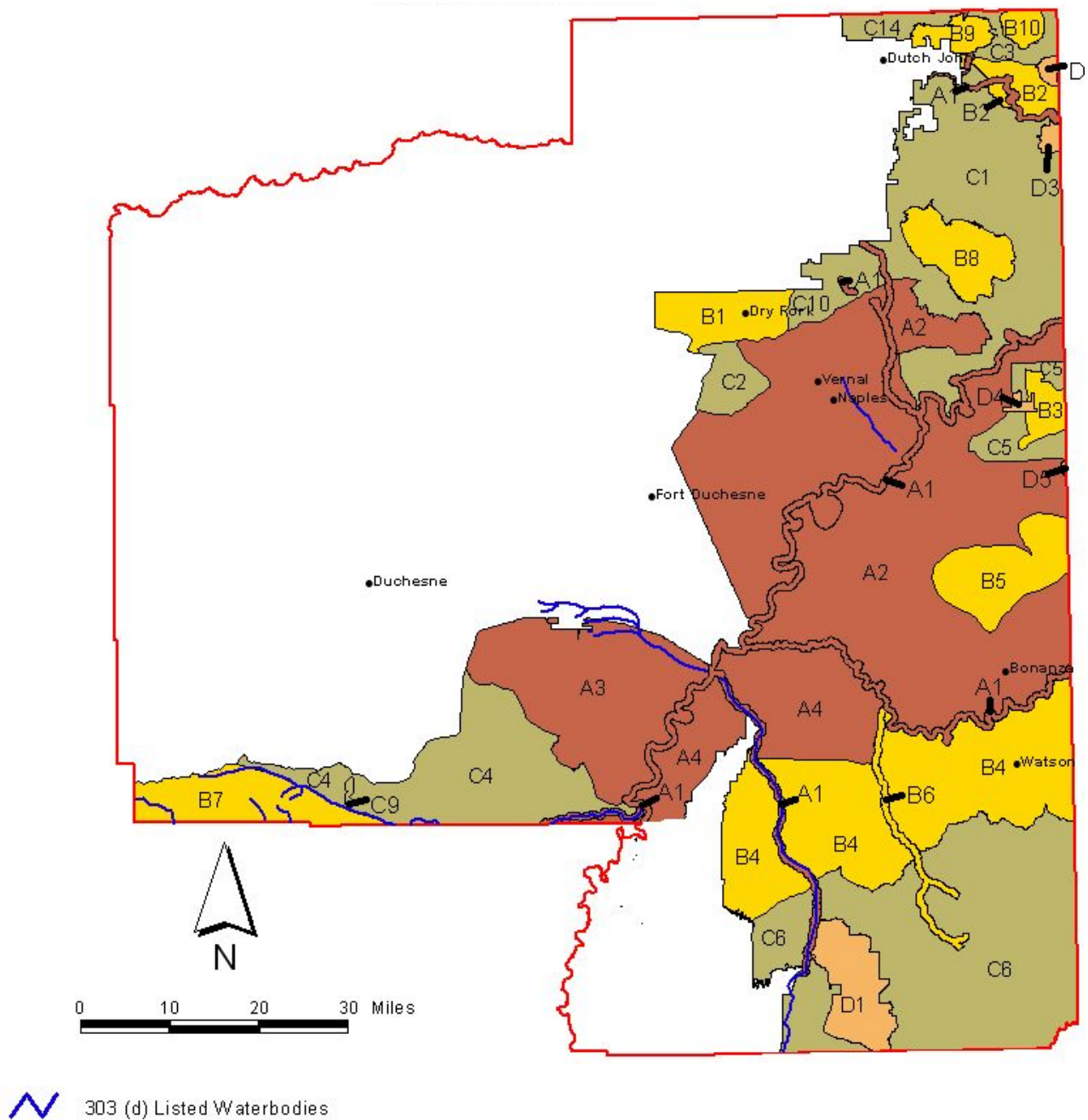
Wildland fire suppression, wildland fire use, prescribed fire, and non-fire fuel treatments would result in smaller and less severe wildland fire over the long term. These would have fewer impacts on stream flows and nutrient and sediment loads. A trend towards fewer severe wildfires would increase soil stability and would enhance overall stream bank and channel stability and PFC of the watershed. Some areas would see a more sustainable supply of woody debris or stream bank vegetation, both of which would also increase bank stability.

Planned fire actions and eventual restoration of natural fire regimes, under the Proposed Action, would improve water resources by reducing the risk of high severity wildfire and promoting native vegetation types. The Proposed Action would also reduce erosion potential in the long term by fostering a healthy, native understory. The Proposed Action would allow more flexibility in implementing and timing planned actions that would protect water resources.

Groundwater





Wildland fire suppression, wildland fire use, prescribed fire, and non-fire fuel treatments would result in smaller and less severe wildland fire over the long term. A trend towards fewer large, severe wildfires (that otherwise may cause damage to soil resources and possible resultant impacts to groundwater) would occur. This is related to a reduction in the alteration of infiltration rates and would be realized through more vegetation surface cover and root zone presence and less fire-caused hydrophobicity.

FIGURE 4.3: 303(D)-LISTED WATERBODIES AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



 303 (d) Listed Waterbodies

CATEGORY

-  A Wildland fire is undesirable
-  B Unplanned fire is undesirable
-  C Wildland fire is desirable to manage ecosystems
-  D Wildland fire is desirable and there are few constraints

4.2.8 WETLANDS AND RIPARIAN ZONES

Short-term Impacts

The Proposed Action includes RPMs that would help protect riparian and wetland resources. However, the potential exists for wildland fire suppression to impact wetlands and riparian zones.

Riparian areas are found throughout the Vernal planning area and in all suppression categories (A, B, C, and D). Under the Proposed Action, burning in riparian areas and wetlands would generally be avoided; however, low-intensity fires could be allowed to burn. Short-term impacts of suppression activities could include vegetation damage or destruction. This reduction in or loss of streamside vegetation could increase stream temperature and degrade aquatic habitat. These potential impacts to riparian areas would be minimized through an AMR at the time of ignition and throughout the fire event and by implementation of any needed post-fire ESR actions.

Vegetation disturbance associated with prescribed fire and non-fire fuel treatments would be evaluated through site-specific that would consider impacts related to riparian and wetland functioning. Often, these impacts are short-term, and conditions return to pre-fire levels once vegetation is re-established. Efforts would be made to protect vegetation and restore native species after a disturbance.

Long-term Impacts

Under the Proposed Action, riparian area and wetland conditions would improve through removal of undesirable vegetation, thereby lessening the chances of high-severity wildland fire, and promoting the growth and natural succession of native vegetation types.

Over time, wildland fires would be smaller and less severe, resulting in fewer impacts to vegetation and sediment loads. A trend towards fewer severe wildland fires would increase soil stability, enhance bank and channel stability, and promote PFC of the watershed. It would also reduce any impacts that may occur from fire suppression.

By fostering a healthy, native understory, prescribed fire and non-fire fuel treatments would improve riparian resources and reduce erosion potential in the long term.

4.2.9 WILD AND SCENIC RIVERS

Short-term Impacts

Though minimized by following management guidelines, short-term impacts on eligible river segments resulting from management response to wildland fire efforts may include ground disturbances associated with suppression and control efforts (e.g., hand lines and spike camps). Short-term and limited impacts for wildland fire suppression could include disturbance to soils, surfaces and groundwater, watershed functions, vegetation conditions and habitats for SSS and fish and wildlife. Impacts would be minimized by post-fire rehabilitation efforts.

The AMR during a wildland fire would consider impacts to or impairment of the values inherent to each of the river segments; the AMR may include limiting the use of mechanical suppression activities, recommending smaller fire camps, and removing tracks and traces of fire suppression actions. Due to the increased emphasis on suppression, those river segments within Category A or B FMUs would likely see more short-term impacts from suppression activities than those lands in Category C or D FMUs. A burned or modified landscape and limited visibility may be aesthetically displeasing to recreationists, but these impacts on the

quality of visitor experience would be limited to the duration and area of the fire and likely would not affect overall use and appreciation of the unique values present within other portions of these designations.

ESR activities would stabilize wildfire areas, minimize the threat of invasive and noxious weed species becoming established, and preserve the natural and unique values inherent to them. ESR efforts may be noticeable after fire events as the areas become revegetated. Suppression and ESR efforts would be designed, when possible, to avoid impairment of outstandingly remarkable values. Suppression efforts and ESR actions would not typically impact or impair a segment's suitability for designation as wild or scenic.

All planned management activities, including prescribed fires and non-fire fuel treatments, would undergo a site-specific planning to determine potential impacts to wild and scenic river suitability, thereby limiting impacts. Additionally, RPMs would minimize the impairment of values under the Proposed Action.

Long-term Impacts

The Proposed Action would result in modification of the current condition to a DWFC that would be more historically representative of the natural vegetation cover. Long-term impacts associated with use of an AMR to wildfire suppression, wildland fire use, prescribed fire, and mechanical treatments are the decreased risk of large severe wildfire events. With removal of hazardous fuels, trends toward preserving the characteristics and values that make these designations special would result.

By implementing the proposed fire management goals of reducing hazardous fuels to restore natural ecosystems and allowing fire to function in its natural ecological role, the natural conditions and array of supplemental values contained within these management areas would be enhanced and preserved. Likewise, visitor experience and opportunities may be enhanced by restoration of the historical natural condition.

4.2.10 WILDERNESS STUDY AREAS

As shown in **Figure 4.4**, all WSA lands are found within Category D FMUs. The Book Cliffs Instant Study Area is in a Category C designation. Management activities would be designed to minimize impacts on wilderness suitability of WSAs.

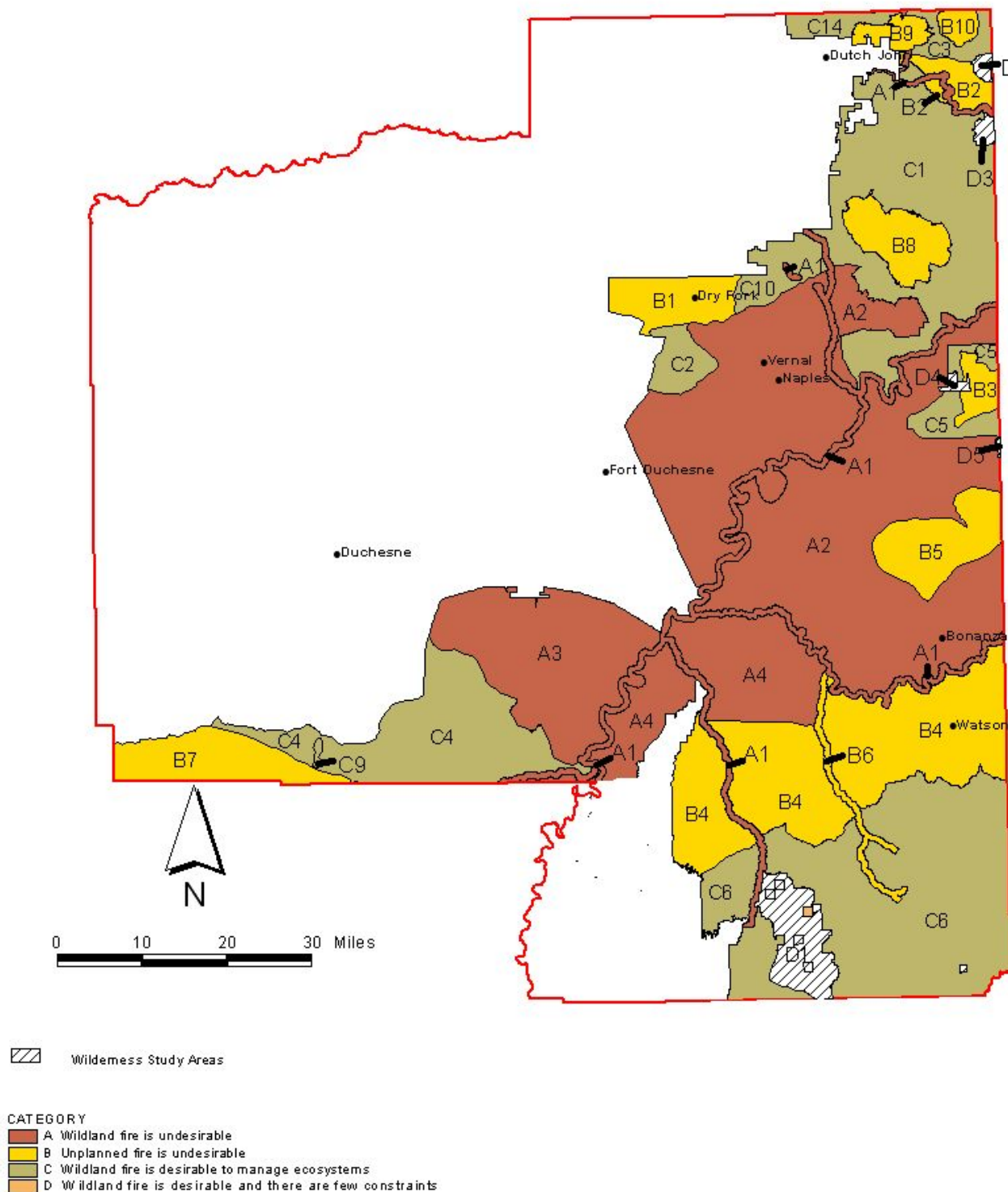
Short-term Impacts

Under the Proposed Action, there would be a less aggressive suppression response to wildland fires. Though minimized by following WSA management guidelines and implementing RPMs associated with the Proposed Action, short-term impacts on WSAs resulting from management response to wildland fire suppression efforts could include ground disturbances associated with suppression and control efforts (e.g., hand lines, spike camps, and ESR activities).

WSAs are within Category C and D FMUs and would likely see less short-term impacts from suppression activities. However, the effects of wildland fire itself may be more widespread. ESR would be implemented to stabilize areas minimizing the threat of invasive and noxious weeds while preserving the natural and unique values inherent to each WSA. Application of wildland fire use would increase the potential for more widespread impacts from fire, while eliminating ground-disturbing impacts associated with suppression.

All planned management activities, including prescribed fires, would undergo a site-specific environmental evaluation to determine potential impacts to the resource prior to being approved. Methods used to implement these fire management actions would be required to minimize impacts to the resource being protected. Prescribed fire would help maintain the naturalness of WSAs by allowing wildfire to play a more natural role in the ecosystem.

FIGURE 4.4: WILDERNESS STUDY AREAS AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



Seeding within WSAs would not impair their suitability for preservation as wilderness. Because native species would be used for seeding and restoration, the naturalness of the area would be preserved and enhanced.

Opportunities for solitude and primitive and unconfined recreation could be restricted (e.g. from access and direct use) or impaired during fire management activities. However, these impacts on the quality of visitor experience would be limited to the treated area or duration of the treatment, would not likely affect overall use.

Long-term Impacts

The Proposed Action would result in modification of the current vegetation condition to a DWFC that would more closely reflect historic vegetation conditions. Long-term impacts associated with the use of the AMR for wildland fire suppression, the use of wildland fire, prescribed fire, and non-fire fuel treatments would result in a decreased risk of severe wildland fire. A trend away from severe fire would result from removal of hazardous fuels over time. Together, removal of hazardous fuels and a reduced risk of severe wildland fire would benefit WSAs by preserving opportunities for solitude and primitive recreation.

By implementing proposed fire management goals (e.g., reducing hazardous fuels to restore natural ecosystems and allowing fire to function in its natural ecological role), values contained within these management areas would be enhanced and preserved. Likewise, visitor experience and opportunities would be enhanced by restoration of a more natural ecological condition.

4.2.11 LIVESTOCK GRAZING

Short-term Impacts

The primary purpose of fire management actions on rangelands within the Vernal planning area is to reduce fuels, reduce undesirable vegetation species, and improve native vegetation. The Proposed Action would result in increased production, nutrient quality and diversity, and palatability of herbaceous plants. Fire breaks up large tracts of sagebrush and pinyon and juniper woodland dominated landscapes and establishes a mosaic of vegetation types and age classes. Creation of openings and more nutritious, palatable forage would attract livestock concentration and result in minor to moderate shifts in livestock utilization and distribution patterns.

Proposed Action goals and the AMR would potentially result in more acres of vegetation being burned than in the No Action Alternative. Aggressive suppression would be used in areas susceptible to cheatgrass invasion and expansion, giving the Proposed Action the flexibility to limit impacts associated with invasive species. Impacts from invasive species could also be lessened by implementing ESR actions designed to control invasive species following wildfires.

Another impact on grazing after a wildland fire is the temporary loss of allotment use. Grazing would be curtailed on the impacted areas for a minimum of one growing season or a minimum of two growing seasons if the rangeland has been reseeded. This could cause negative economic impact on the permittee and the need to find alternative grazing or feeding arrangements. Curtailing livestock use on a burned area is most critical the first growing season after fire, particularly in plant communities of arid and semiarid regions (Trlica 1977). If livestock have premature access to the burn, the full benefits of fire may not be realized and negative impacts may occur (Bunting et al. 1987).

Under the Proposed Action, approximately 41 percent of grazing allotments fall into Category A, 21 percent in Category B, 35 percent in Category C, and three percent in Category D. As indicated by this distribution, the majority of grazing allotments are located in areas where wildland fire is less desired. However, 38 percent of allotment acres have been identified where wildland fire may be used. This is in contrast to the

No Action Alternative, where wildland fire use would not be allowed. Therefore, the use of wildland fire and less aggressive suppression under the Proposed Action could increase the likelihood of economic impacts in the short-term. **Figure 4.5** presents the location of grazing allotments relative to fire management categories.

Prescribed fire and non-fire fuel treatments would be coordinated with the permittee to reduce impacts from the loss of grazing use of the impacted portion of the allotment. Pre-fire rest from grazing is required on many range sites to allow the accumulation of enough fine fuel to carry a prescribed fire. This pre-fire management is important in areas where grass and shrub litter may be the main carrier fuels (Jones and DeByle 1985). However, range resources would benefit from an increase in desirable vegetation following treatments.

Non-fire fuel treatments that involve the use of seeding would impact permittees by eliminating grazing from an allotment for a minimum of two growing seasons. Treatments that do not use seedings would not require any post-treatment rest from grazing. Post-recovery use of the grazing allotment would benefit through improved forage composition.

Long-term Impacts

Long-term impacts from less aggressive fire suppression, the reintroduction of fire, and more fuel treatments in the Proposed Action are expected to make grazing resources more productive and stable. Removal of hazardous fuels would reduce the risk of severe wildfire, which would decrease the likelihood that such an event would result in longer recovery periods for impacted allotments. However, restoring the natural role of fire would continue to have some economic impacts to permittees since rest would be required following fire. Prescribed fire and non-fire treatments would affect a similar trend toward increases in ecosystem health and stability, result in improvement of grazing resources, and reduce the potential for longer recovery periods. This would be particularly evident in FMUs with cheatgrass infestation problems.

4.2.12 WOODLANDS AND FORESTRY

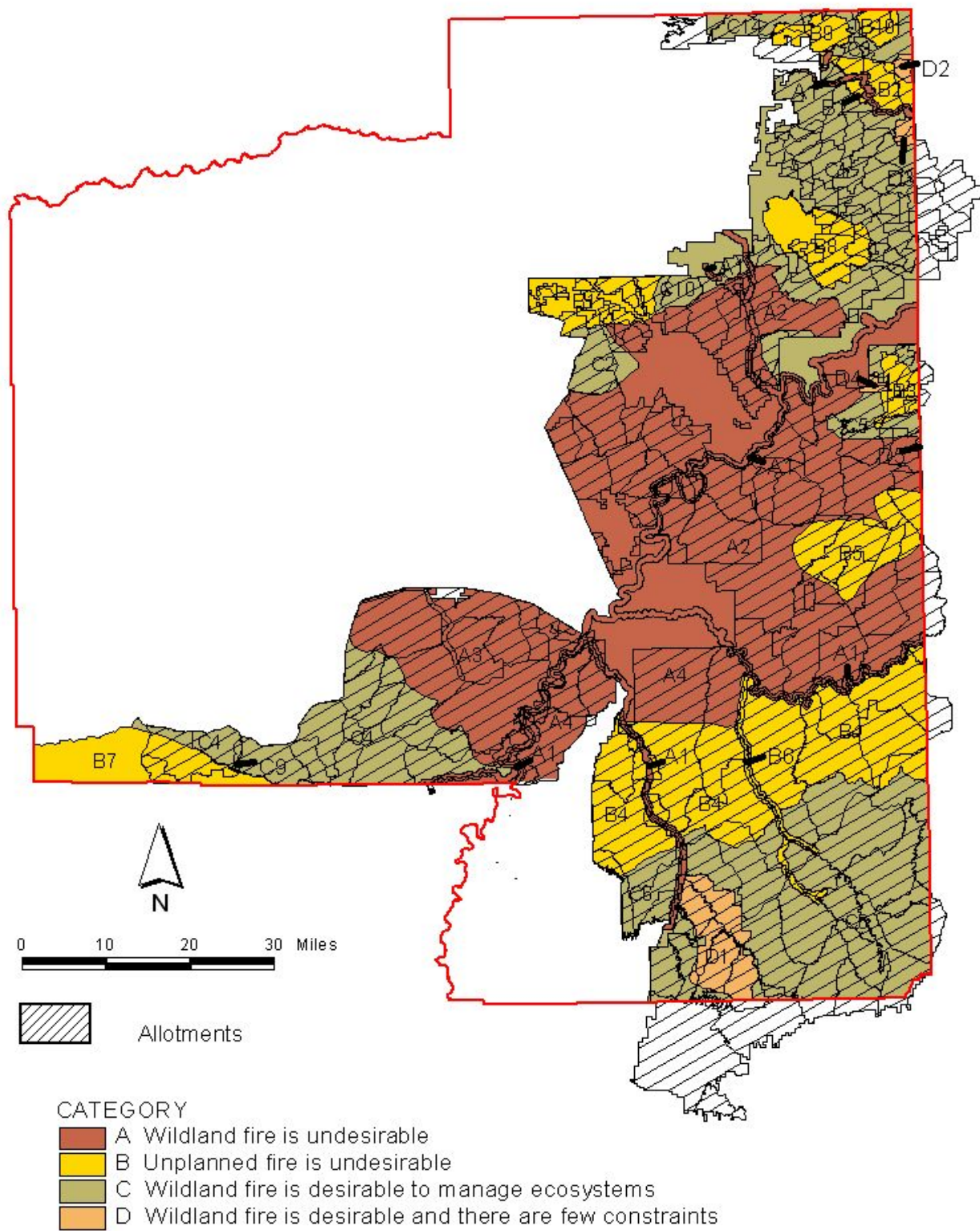
Short-term Impacts

Under the Proposed Action, less aggressive wildland fire suppression may result in more acres of woodlands and forests being burned, thus decreasing the amount of biomass, timber, firewood, and pinyon nut harvesting opportunities in the areas affected by these events. In the short term, a noticeable change in the acreage of pinyon and juniper woodland that has encroached outside of its historical range would not be expected. The planting of seedlings through ESR actions would increase the occurrence of desirable forest types.

The use of prescribed fire in forests is sometimes accompanied by non-fire treatment methods to modify vegetation to result in lowered burn intensity. In the short term, this would increase the opportunity for the harvesting of biomass and firewood in small site-specific areas.

The use of non-fire treatment methods to reduce the occurrence of younger age classes in areas of old growth could increase the survivability of old growth forests during fire events (Howard 2003). This increased survivability could increase the availability of higher economic value forest products, particularly in mixed conifer and ponderosa stands.

FIGURE 4.5: GRAZING ALLOTMENTS AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



Long-term Impacts

Long-term impacts from the wildland fire suppression and wildland fire use would include a reduction in the acres of pinyon and juniper woodland encroaching on land outside of its historic range. This would decrease the availability of biomass and firewood collection in this vegetation type. This impact would be less pronounced in other forested vegetation types since they are not targeted for a reduction in their range of occurrence.

Prescribed fire and non-fire treatments would result in a gradual trend toward less biomass availability. The use of non-fire treatment methods to reduce the occurrence of ladder fuels in areas of desirable old growth forests, particularly ponderosa stands, would also decrease fire severity and increase survivability of old growth forests during fire events in the long term (Howard 2003). This would increase the availability of higher economic value forest products, particularly in mixed conifer and ponderosa stands.

4.2.13 VEGETATION

The impacts of fire at a species level for each vegetative type can be found in **Appendix H**.

Short-term Impacts

All Vegetation Types

FMU categories and their relationship to vegetation are displayed on **Figure 4.6**. **Table 4.1** shows the percentage of each of the vegetation type groups in each of the FMU categories. Effects are described for each vegetation type. Wildland fire suppression and wildland fire use have the potential to disturb all vegetation types due to fireline construction or other initial attack actions, and from fire itself. For all planned actions, site-specific analysis would consider impacts to vegetation health thereby minimizing negative vegetation impacts from prescribed fire, non-fire fuel treatments, and ESR actions.

TABLE 4.1: PERCENT OF VEGETATION TYPE GROUPS AND FMU CATEGORY UNDER THE PROPOSED ACTION

Vegetation Types	Fire Management Unit Category			
	A	B	C	D
Salt desert shrub	81%	13%	6%	0%
Sagebrush	47%	26%	24%	3%
Pinyon and juniper woodland	7%	28%	58%	7%
Ponderosa pine	0%	36%	64%	0%
Mountain shrub	2%	19%	77%	3%
Mixed conifer	1%	8%	81%	10%
Aspen	0%	0%	100%	0%

Salt Desert Shrub: Aggressive fire suppression would be the AMR for this vegetation type in most circumstances. Through implementing ESR actions and following RPMs for the prevention of invasive species (**Appendix E**), cheatgrass, and noxious weed invasion would be reduced and the appropriate vegetation seeded in this vegetation type. Because noxious weed and cheatgrass invasion are the main reasons that the vegetation type is in FRCC 3, ESR actions should improve the conditions and possibly reduce the FRCC.

Prescribed fire would not be used in this vegetation type, due to the the historical lack of fire in this vegetation type and the high potential for noxious weed invasion following disturbance. Consequently, the damaging effects fire has on this type (invasion of noxious weeds and lack of post-fire regeneration) would be avoided. When planned carefully, fire and follow-up rehabilitation and restoration would also reduce the risk of non-native species invasion.

Little to no non-fire fuel treatments are planned in this vegetation type. The only treatments implemented would be to restore the native vegetation communities. Therefore, negative impacts from non-fire fuel treatments would not occur.

Sagebrush: Through implementing ESR actions and following RPMs (**Appendix E**), cheatgrass, and noxious weed invasion would be reduced and the appropriate vegetation seeded in this vegetation type. Prescribed fire (coupled with seeding when appropriate) would reduce crowded and decadent sagebrush and reduce overstory competition favoring establishment of native grasses and forbs (Paysen et al. 2000). RPMs designed to avoid establishment of invasive species and noxious weeds following prescribed fire would restrict the amount of undesirable vegetation in these areas.

Non-fire fuel treatments could be used to both reduce the existing FRCC of this type from a 2 or 3 to a FRCC of 1 or 2, and control/reduce existing and potential noxious weed invasion through mechanical and/or chemical methods. Non-fire treatments would also remove any encroaching P-J that has also led to a higher FRCC. Because of the high potential for noxious weed and cheatgrass invasion, this vegetation type is in FRCC 2 or 3; vegetation treatments (including seeding) should improve the conditions and reduce the FRCC.

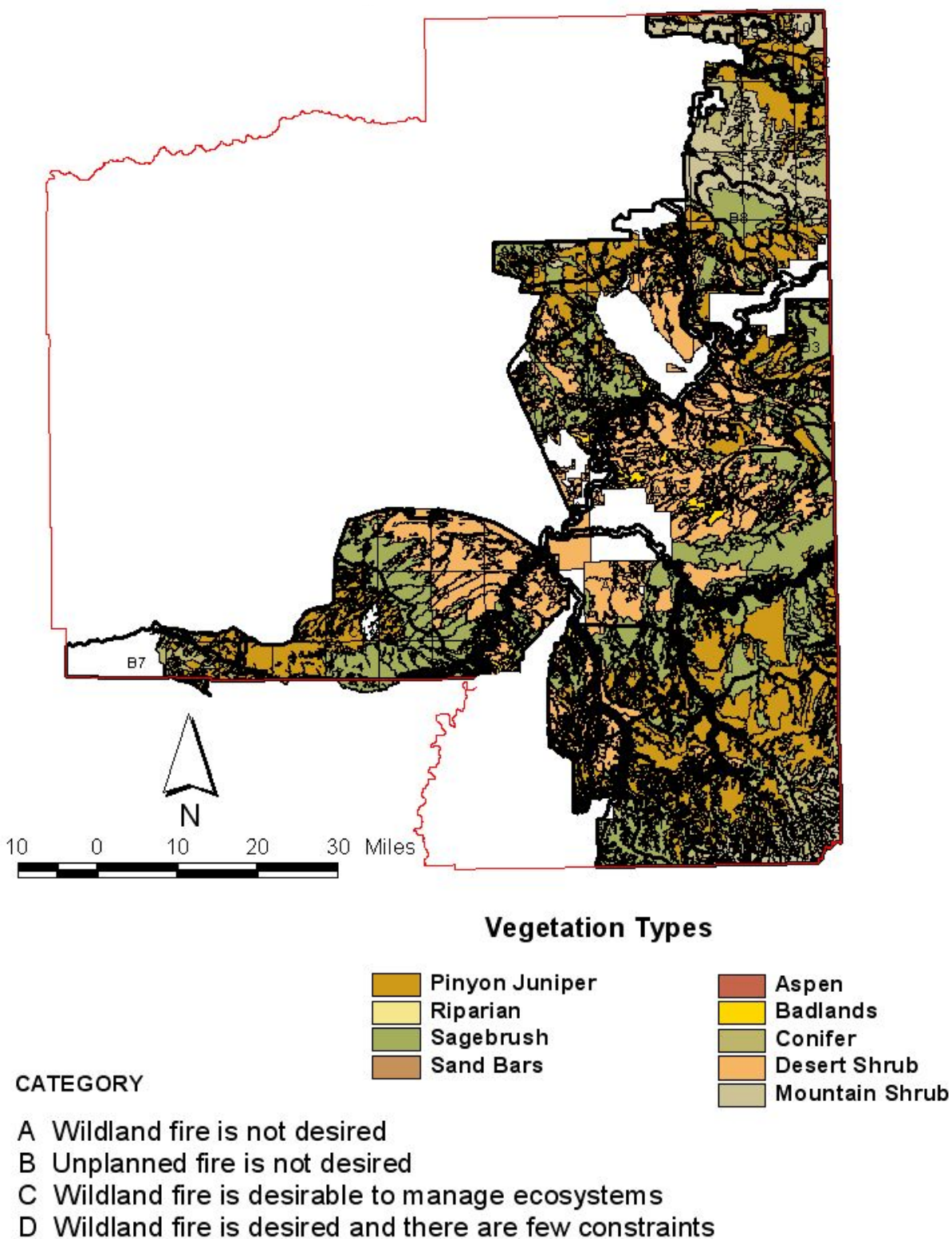
Pinyon and Juniper Woodland: Less aggressive wildland fire suppression would result in larger fires reducing the density of pinyon and juniper woodland. Prescribed fire would be lethal to many small or young juniper trees.

Non-fire fuel treatments would reduce densities of juniper and pinyon, reduce woodland encroachment into historic sagebrush communities, and would consequently reduce fuel loads. These treatments would also likely reduce the potential for invasion of cheatgrass since seeding is typically a component if there is a risk of cheatgrass invasion.

Ponderosa Pine: All acres of ponderosa pine vegetation type in the Vernal planning area is in FRCC 3. Non-fire fuel treatments in FRCC 3 areas would help reduce excessive fuel loadings prior to the re-introduction of fire as a management tool. Wildland fire use and prescribed fire would reduce encroachment by juniper into ponderosa pine habitats further reducing the risk of future crown fires. Seeding and tree planting following fire would restore and rehabilitate burned areas resulting in maintenance and perpetuation of this vegetation type.

Mountain Shrub: Removal of encroaching woody species by wildland fire would enhance and maintain mountain shrub communities since these types readily sprout following fire. Post-fire ESR actions and RPMs would reduce the risk of cheatgrass invasion following fire. Other beneficial effects of fire on the vegetation type would be a reduction of available fuels and a trend toward lower FRCC. Non-fire fuel treatments would reduce fuel loadings in this vegetation type and seedings would reduce the risk of cheatgrass invasion.

FIGURE 4.6: VEGETATION TYPES AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



Mixed Conifer: The mixed conifer types frequently benefit from fire. Effects from fire in this type would include a reduction in fuel loading and fuel density. These effects increase the nutrients and water available to remaining plants and reduce the severity of future fires. Wildland fire use and prescribed fire, as well as non-fire fuel treatments, can be very effective at reducing fuel loadings and densities on mixed conifer sites. Effects from prescribed fire would be much the same as wildland fire effects. Non-fire fuel treatments would reduce fuel loadings and tree densities in this vegetation type and would reduce the risk of noxious weed and cheatgrass invasion following severe fire.

Aspen: With the use of prescribed fire and wildland fire use and increased wildfire acres from less aggressive suppression, FRCC would gradually be reduced as fire is re-introduced. Conifer encroachment into aspen would be reduced due to wildland fire use, prescribed fire, and non-fire fuel treatments resulting in increased aspen sprouting.

Long-term Impacts

All Vegetation Types

All vegetation types would exhibit long-term reductions in fuel loadings, reduced risk of invasion from noxious weeds and cheatgrass, and decreased density of overstory (i.e., tree, woodland and shrub) vegetation. Overall, this would result in trends toward lower FRCCs. Many of these long-term effects would result from the application of ESR actions and by following RPMs applied as part of the Proposed Action.

Where management actions occur, a long-term improvement in FRCC would result in less risk of wildland fires with characteristics (fire behavior, size, severity, or frequency) beyond the natural range of variability. More natural fire regimes (fire return interval and severity) would benefit all vegetation types found in the Vernal planning area.

4.2.14 FISH AND WILDLIFE

Fire management activities have the potential to directly and indirectly affect fisheries and wildlife throughout the Vernal planning area, depending upon treatment timing, extent, location, elevation, duration, fuel, and severity of fires, as well as habitat type or vegetation communities of the treated area. Effects to vegetation communities are discussed separately in Section 3.3.13. Any effects to vegetation have the potential to directly or indirectly affect the fish and wildlife species that inhabit them or areas adjacent to (or downstream from) them.

RPMs were built into the Proposed Action to minimize or eliminate adverse effects to species and habitat. RPMs would be implemented during fire management actions, as applicable. In addition, all planned actions would undergo site-specific analyses prior to implementation, and would consider impacts to fish and wildlife. Site-specific analysis would typically incorporate measures to lessen impacts.

Short-term Impacts

Fish

RPMs included in the Proposed Action would limit the potential for impacts to fisheries and aquatic resources. However, direct effects could occur from wildland fire suppression and wildland fire use, including: introduction of fire retardant, aviation fuel, or lubricants into streams and wetlands; erosion of exposed soils from fireline construction on steep slopes adjacent to streams; damaged riparian vegetation and soils (resulting in erosion) from use of heavy equipment and establishment of fire camps; and reduced natural stream flow during drafting and pumping. These impacts would adversely affect water quality of the various fisheries throughout the Vernal planning area. The collective short-term impacts of increased

sedimentation (from erosion) could have watershed-wide effects including changes in temperature, turbidity, and water chemistry.

Indirect impacts could include changes in the survival or successful reproduction of aquatic prey species (e.g., for birds and carnivores) due to increased sedimentation and subsequent habitat modification as a result of upstream erosion.

Because RPMs limit acres and severity of prescribed fire, as well as constrain non-fire fuel treatments in and adjacent to riparian and wetland and water habitats, short-term adverse impacts from these fire management activities would be minimized or eliminated.

Non-game and Big Game Species

Short-term adverse impacts (e.g., direct species mortality, habitat destruction, and habitat displacement) to non-game and big game species would be minimized by RPMs. Impacts would be further minimized through ESR activities that would be conducted following wildland fire suppression events.

Direct effects from wildland fire suppression could include: damaged vegetation (including forage resources) from the use of heavy equipment and establishment of fire camps; weed invasion; an increase in acres of undesirable habitat types; a decrease in understory diversity and overall species richness; an increase in insect herbivory; and suppressed flowering from the introduction of fire retardant or foam (Adams and Simmons 1999). Direct effects from prescribed fire and non-fire fuel treatments could include mortality to individual animals, habitat alteration or damage, species displacement, and modification or destruction of forage or prey resources.

A large portion of acres designated as Category C or D are comprised of mountain shrub, pinyon and juniper woodland, or sagebrush habitat. Species utilizing these three habitats would be more likely to incur short-term adverse impacts (e.g., mortality, habitat destruction, and temporary displacement to nearby suitable habitat) from fire management activities. Species that are found only in mixed conifer, riparian and wetland, and water would be less likely to incur short-term adverse impacts.

Raptors and Migratory Birds: Raptors that are found in mountainous and forested habitats (e.g., mountain shrub, mixed conifer, ponderosa pine, and aspen), and migratory birds that generally breed at higher elevations would likely incur few short-term impacts because these habitats more closely reflect a natural fire regime. These higher-elevation types would have fewer acres of treatments identified. However, raptors and migratory birds found within or using a variety of vegetation group habitats would likely incur impacts from wildland fire use, prescribed fire, and non-fire fuel treatments. Lower-elevation habitats, such as pinyon and juniper woodlands, are relatively far-removed from their natural fire regime and would be prioritized for fire management activities. However, because RPMs would be considered and implemented, as appropriate, for fire management actions, direct impacts would be limited. Those impacts would include mortality, habitat destruction, and displacement. Indirect impacts could include a short-term reduction in available prey sources and increased competition between the same species for the same prey base.

Small Mammals: Vegetation communities for which RPMs have been developed (e.g., sagebrush and riparian and wetland), would likely maintain populations of small mammals during the short-term. Vegetation communities for which RPMs have not been explicitly developed could exhibit a decrease in small mammal abundance in the short term (i.e., for the duration of a fire event or non-fire fuel treatment).

Carnivores and Predators: Carnivores and predators would be less likely to incur short-term adverse impacts than species found in some other habitats because mountainous and forested habitats (in which carnivores and predators are generally found) would be a lower priority treatments resulting in vegetation conversions. Carnivores and predators could incur adverse impacts from wildland fire suppression across all

habitats from vegetation alterations. Impacts from fire management activities could include mortality, habitat alteration or destruction, displacement, a reduction in food sources and increased competition between the same species for the same prey base.

Amphibians and Reptiles The habitats upon which amphibians and reptiles rely are relatively far-removed from their natural FR. These species groups could incur short-term adverse impacts from fire management actions including mortality, habitat destruction, and displacement. However, because RPMs would be implemented, direct impacts to amphibians would be limited.

Long-term Impacts

Fish

Long-term impacts to fisheries and aquatic resources would be minimized or avoided by implementation of RPMs. Long-term beneficial impacts to fisheries would include an incremental reduction in the risk of severe wildland fire and a reduction in adverse impacts from wildland fire suppression activities that would be associated with wildland fire (regardless of severity) in fisheries habitat.

Non-game and Big Game Species

The long-term effects of the Proposed Action on fish and wildlife species found within the Vernal planning area would be similar to the long-term effects described for special status animal species (Section 3.3.6). Because long-term effects to non-game and big game species groups (raptors and migratory birds, small mammals, carnivores and predators, amphibians and reptiles, and big game) would be common to all, they are summarized below. Regardless of species or associated habitat, overall long-term effects to many non-game and big game species and their habitat would be beneficial.

With less aggressive fire suppression, and wildland fire use, prescribed fire, and non-fire fuel treatments used to minimize fuel loading, the vegetation communities and wildlife habitats within the Vernal planning area would transition over time to more closely reflect conditions associated with a natural fire regime. This would create a more stable ecosystem in which the threat of an unnaturally severe wildland fire would be minimized.

Because wildland fire use and prescribed fire would not likely consist of large, severe fires, mortality or long-term displacement of species would likely be avoided. Populations could be displaced for longer periods of time if management activities were implemented repeatedly within the same treatment area (e.g., mechanical treatment followed by prescribed fire followed by chemical treatment). However, to the extent that suitable habitat were available nearby, these impacts would be offset by the beneficial reinstatement of a natural fire regime.

Because establishment of noxious weed populations would be minimized following fire management actions (through seeding, RPMs, and project-level stipulations), long-term effects on habitat would include a gradual increase in native species diversity that would more closely reflect that associated with a natural fire regime.

4.2.15 SOILS

Short-term Impacts

Under the Proposed Action, more acres of BLM-managed land would be affected by fire management actions. A loss of vegetative cover due to fire management actions could affect soil quality through the loss of soil structure and temporary reduced porosity of soils in these impacted areas. This reduction in porosity and structure could result in a change in infiltration rates and increased erosion and runoff (Ralston and Hatchell 1971). ESR actions and seeding associated with wildland fire suppression and fuels treatments would minimize

direct effects to soil health, (e.g., loss in soil structural stability, increased soil compaction), and would address indirect impacts associated with soil loss and the potential for sediment loading and sedimentation. Erosion controls and revegetation may be proposed as post-fire treatments that would serve to stabilize these sites and to contain and control soil loss.

Where expected fire severity could adversely impact sensitive soils, the AMR to wildland fire would be an aggressive initial action. Some level of ground-disturbing activities associated with suppression, prescribed fire, and non-fire fuel treatments would still be likely to occur. Indirect impacts include potential soil loss from wind and water erosion. Planning flexibility afforded by the Proposed Action would allow implementation of RPMs to minimize potential direct and indirect effects to soil.

Long-term Impacts

A trend toward less severe wildfires would result in fewer impacts to soil quality (including microbial populations, soil temperatures and the chemical and physical structure of the soil). Rehabilitation actions could include the use of erosion controls and/or revegetation that would serve to stabilize these sites to reduce soil loss.

By fostering healthy, native understory communities, wildland fire use, prescribed fire, and non-fire fuel treatments would improve the soil resources and reduce erosion potential in the long term. Decreased potential for destruction of biological crusts due to severe fire events would also reduce the erosion potential and increase fixation of atmospheric nitrate. Planned actions that would consider site-specific soil impacts would continue to reduce the likelihood of severe wildfires that result in loss of soil structure and altered porosity and infiltration rates. As fire is restored to the ecosystem, there would be fewer indirect impacts from large, severe wildfires including potential sedimentation of streams and reservoirs from wind and water erosion and fugitive dust from wind erosion.

4.2.16 RECREATION

Short-term Impacts

Because the Proposed Action includes RPMs that would protect developed special recreation management areas and recreation site infrastructure from wildland fire, any wildfire that presents a threat to a developed recreation site would be fully suppressed. The potential exists for wildland fire suppression to impact developed recreation sites and infrastructure.

Infrastructure most likely to be impacted by wildfire and suppression efforts includes trails and OHV routes, interpretive and directional signage, and dispersed camping areas with developed sanitation facilities. Visitor experience may also be impacted by aesthetic qualities of the recreation area, degradation of air quality from smoke and road, trail, and route closures during and following wildfire suppression. The most abrupt impact to potential recreationists is the complete or partial closure of recreation sites and facilities or even evacuation of those recreationists. Other effects might include noise and visual impacts from ground equipment, helicopters, and air tankers delivering water, fire retardants, fire-fighting equipment, and personnel. Indirect impacts of wildfire at developed facilities may include mass wasting on slopes, increased erosion, and hazards associated with dead standing vegetation. Revegetation efforts may temporarily close areas to use.

The RPMs would decrease the potential for impacts to developed facilities. Higher value sites and facilities would take precedence for protection. Despite potential negative impacts on developed recreation sites and facilities as a result of wildland fire, a positive impact would be the opportunity to educate the recreating public of the role of fire in the landscape (Silverman 1993).

Wildland fire use, prescribed fire, and non-fire fuel treatments could negatively impact the aesthetic quality of developed recreational sites and facilities. However, no impacts to the infrastructure or natural features at these sites are anticipated due to the planning required prior to implementation. Additional impacts from these actions may include temporary site closures and the presence of crews performing the action. The aesthetic impacts would be temporary. Positive impacts include the removal of fuels, which left in place would create a wildfire danger to the site and facilities.

Long-term Impacts

Wildfire suppression management direction may impact developed recreation sites and facilities by burning more of the surrounding vegetation, relative to the No Action Alternative, thereby creating aesthetic changes to the landscape. However, a trend toward a more desirable FRCC and the associated potential for less severe fire events would make the potential for the loss of these resources and visitor use days less likely. The movement of vegetation toward a FRCC would lessen the potential for uncontrollable, severe wildland fire.

Wildland fire use, prescribed fire, and non-fire fuel treatments around special recreation management areas would reduce excess fuels, which reduces the risk of large, severe wildland fire and the associated impacts to characteristics these sites are intended to utilize (NPS 2000). The reduced fuel load makes it less likely that a wildfire would burn the entire site. This increases both the level of safety for recreationists and available visitor days.

4.2.17 SOCIOECONOMICS

Short-term Impacts

In the short term, air quality and livestock permittees could be adversely affected by the Proposed Action. Prescribed fires and wildland fires would create temporary decreases in air quality and displace livestock from foraging areas. A temporary loss of allotment use could affect the lessees by decreasing their revenue during the time that they are unable to utilize their allotment(s). Wildland fire suppression and wildland fire use could also cause livestock permittees to temporarily lose use and, subsequently, income, because land would be unavailable immediately following a fire. In addition, short-term impacts could include altered transportation routes, disruption of subsistence activities, and temporary increases in noise.

Short-term beneficial effects could include an increase in revenue for communities from increased utilization of local services during suppression activities and treatments.

Long-term Impacts

Long-term beneficial effects could include a reduction in the cost of suppression, an increase in payroll benefits for non-fire and planned ignition treatments, and more protection in communities at risk and WUI areas and for their associated infrastructures and resource values. A decreased long-term potential for severe wildland fire would lead to increased firefighter and public safety, and a likely reduction in loss of property (from a severe fire event) and suppression expenses.

Impacts from fire or treatment procedures would also be beneficial for livestock, resulting in an increase in the quantity and quality of forage. Over time, there would likely be fewer economic losses in the Vernal planning area from severe wildland fires. The subsequent decrease in fires that would otherwise cross land ownership boundaries onto private and county-owned land would result in an overall increase in safety for the general public.

4.2.18 WILD HORSES AND BURROS

Short-term Impacts

Short-term effects on the two HMAs and the one HA in the Vernal planning area would be the potential for temporary displacement of animals, damage to corrals, water storage devices, shelters, and forage loss. However, the AMR would take appropriate action to protect those structures. Use of non-fire and fire treatment projects could pose a temporary loss of resources during the treatment procedure. Altered herd movement routes and temporary increases in noise could also be short-term effects. Because prescribed fire and non-fire fuel treatments are planned, activities could be designed to minimize impacts.

Under the Proposed Action, approximately 53 percent of the HMAs fall into Category A and 21 percent are in Category B. This would leave the majority of HMAs and HA acres in a protected status and reduce the impacts from fire, but may increase the potential for suppression impacts such as ground disturbance and human presence. Seventeen percent are in Category C and nine percent in Category D. This would allow fire to play a role in about 26 percent of the HMA and HA areas. Reduction in loads would occur and post-fire interruption of forage resources would be evident. However, these areas would have less impacts from suppression activities. **Figure 4.7** presents the location of HMAs relative to fire management categories.

Long-term Impacts

A decreased long-term potential for severe wildfire from decreased wildland fire suppression and increased fire and non-fire fuel treatments would lead to increased horse and burro protection and a reduction in loss of corrals, fences, shelters, and watering areas. Impacts from fire or treatment procedures would be positive for wild horses and burros, resulting in an increase in the quantity and quality of forage. Over time, potential loss of wild horse and burro habitat and infrastructure would decrease.

4.2.19 WILDERNESS CHARACTERISTICS

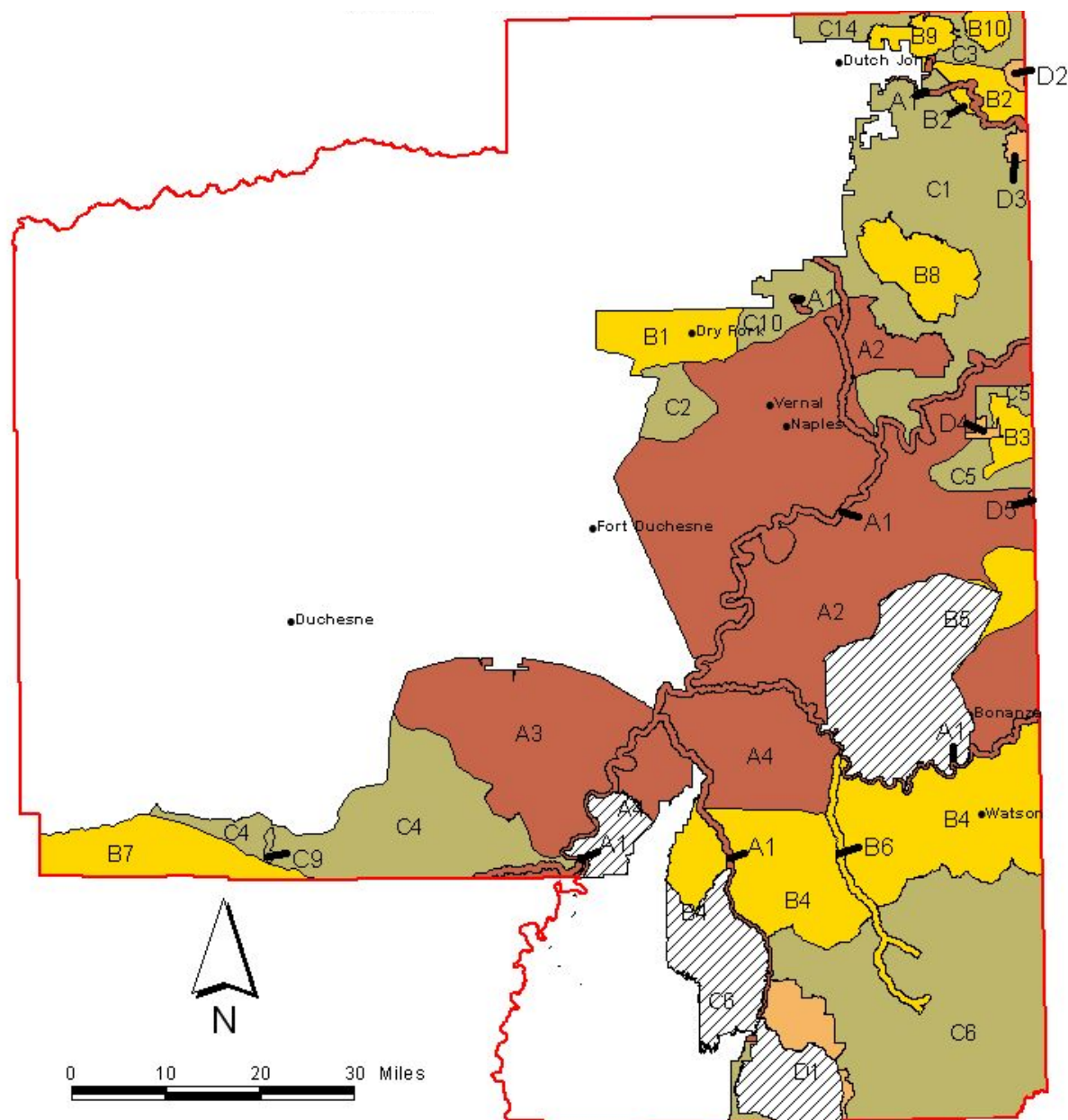
Within the Vernal planning area, approximately 126,001 acres of land have wilderness characteristics. Approximately 38 percent of these acres are found within Category A FMUs, 28 percent within Category B FMUs, 34 percent within Category C FMUs (**Figure 4.8**). Approximately 155,641 acres of land are likely to have wilderness characteristics. Approximately 11 percent of these acres are found within Category A FMUs, 14 percent within Category B FMUs, 75 percent within Category C FMUs (**Figure 4.8**). There would be no acres in Category D FMUs since these FMUs coincide with WSA boundaries where wilderness characteristics have already been determined.

Short-term Impacts

This alternative would allow a less aggressive suppression response, and suppression actions could have adverse impacts on naturalness and opportunities for solitude and primitive recreation. Short-term impacts on wilderness characteristics and areas likely to have wilderness characteristics could include ground disturbances associated with suppression and control efforts (e.g. hand lines and spike camps). Impacts to other related resources such as vegetation, soil, watersheds, etc. are discussed in the appropriate section of this chapter.

Due to the increased emphasis on suppression, those areas with wilderness characteristics, or likely to have wilderness characteristics, found within Category A and B FMUs would likely see more short-term impacts from suppression activities than those areas found within Category C FMUs. Seeding would stabilize these areas following a fire event. This stabilization would minimize the threat of invasive and noxious weeds while preserving the naturalness of an area and opportunities for solitude and primitive recreation.

FIGURE 4.7: HERD MANAGEMENT AREAS, HERD AREAS, AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



 **Vernal HMA/HAS**

CATEGORY





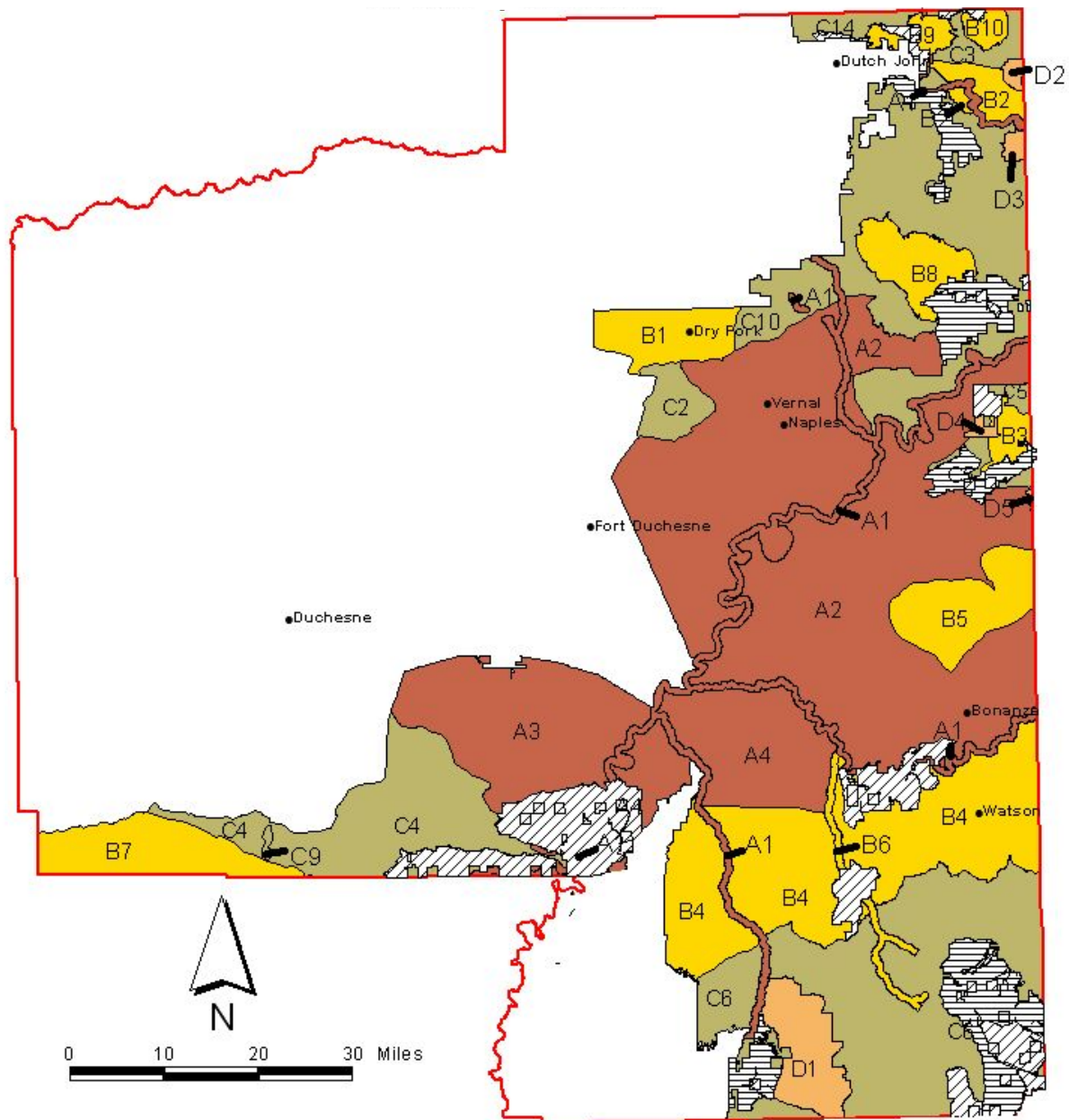
-  A. Wildland fire is undesirable
-  B. Unplanned fire is undesirable
-  C. Wildland fire is desirable to manage ecosystems
-  D. Wildland fire is desirable and there are few constraints

FIGURE 4.8: NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS, NON-WSA LANDS LIKELY TO HAVE WILDERNESS CHARACTERISTICS, AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



Non WSAs likely to have Wilderness Characteristics

Non WSAs with Wilderness Characteristics

CATEGORY

- A. Wildland fire is undesirable
- B. Unplanned fire is undesirable
- C. Wildland fire is desirable to manage ecosystems
- D. Wildland fire is desirable and there are few constraints

Full suppression of wildland fires could be implemented to control fire size and severity within these areas, protecting resource values and minimizing safety concerns on adjacent lands. Wildland fire use could be implemented in Category C areas, and would preserve wilderness values by allowing restoration of natural processes.

All planned management activities, including prescribed fires, non-fire fuel treatments, and ESR actions would undergo a site-specific environmental evaluation to consider potential impacts wilderness characteristics. Site-specific analysis may result in measures to reduce impacts. Therefore, impacts from planned actions would be minimized. Prescribed fire would help maintain the naturalness of these areas by allowing wildfire to play a more natural role in the ecosystem.

Opportunities for solitude and primitive and unconfined recreation could be restricted (e.g. from access and direct use) or impaired during fire management activities. However, these impacts on the quality of visitor experience would be limited to the treated area or duration of the treatment.

Long-term Impacts

The Proposed Action would result in modification of the current vegetation condition to a DWFC that would more closely reflect historic vegetation. Long-term impacts associated with the use of AMRs to wildland fire suppression and wildland fire use and the use of RPMs for prescribed fire and non-fire fuels treatments would trend toward a decreased risk of severe wildland fire. The trend away from severe fire would result from the removal of hazardous fuels over time. Together, removal of hazardous fuels and a reduced risk of severe wildland fire would beneficially affect areas with and likely to have wilderness characteristics, by preserving opportunities for solitude and primitive recreation.

By implementing proposed fire management goals (e.g., reducing hazardous fuels to restore natural ecosystems and allowing fire to function in its natural ecological role), values contained within these management areas would be enhanced and preserved. Likewise, visitor experience and opportunities would be enhanced by restoration of a more natural condition.

4.2.20 MITIGATION MEASURES

RPMs under the Proposed Action would minimize or avoid impacts on resources. No mitigation for impacts would be necessary because of the protection already afforded by the protection measures.

4.2.21 RESIDUAL IMPACTS

No mitigation measures are proposed with the Proposed Action, therefore, no residual impacts from mitigation measures would be present.

4.2.22 MONITORING AND COMPLIANCE

As a part of an adaptive management response to fire planning needs within the state, monitoring measures and compliance with the goals and objectives of this plan would be maintained. This would be achieved through future planning associated with fire management implementation actions. These fire management actions would be evaluated for adherence to the goals and objectives established by this Proposed Action, as well as specific resource requirements contained within the LUPs. Wildland fire impacts would be compared to FMP goals and, if necessary, revisions to the FMP would be incorporated to reflect the impact of non-planned wildland fire events on the planning area resources. Implementation-level fire management actions would be developed to meet resource requirements and may include additional monitoring to evaluate and help ensure conformance to plan-level decisions. The frequency and duration of monitoring would be determined on a case by case basis.

4.3 NO ACTION ALTERNATIVE

4.3.1 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

The ACECs and fire management categories for the No Action Alternative are shown in **Figure 4.9**.

Short-term Impacts

Impacts from existing fire management direction (including an emphasis on full suppression, no wildland fire use, and limited fuel treatments) would be similar to those described under the Proposed Action. The increased emphasis on suppression and the lack of updated RPMs could lead to more severe short-term impacts than those anticipated by the Proposed Action from suppression activities. However, the greater focus on suppression efforts could potentially decrease the amount of ACEC acres that would burn.

Long-term Impacts

The lower amount of planned fuel treatments under this alternative would perpetuate the build-up of unnatural and unsustainable fuel loads. In the long-term there would be a higher risk of large-high severity fire with the potential to damage historic, cultural, physical or scenic values associated with ACEC designations. Suppression efforts implemented to protect these areas could increase impacts to the values present. This could involve the occurrence of ground-disturbing activities in and around ACECs from construction of fire camps and firelines.

4.3.2 CULTURAL RESOURCES

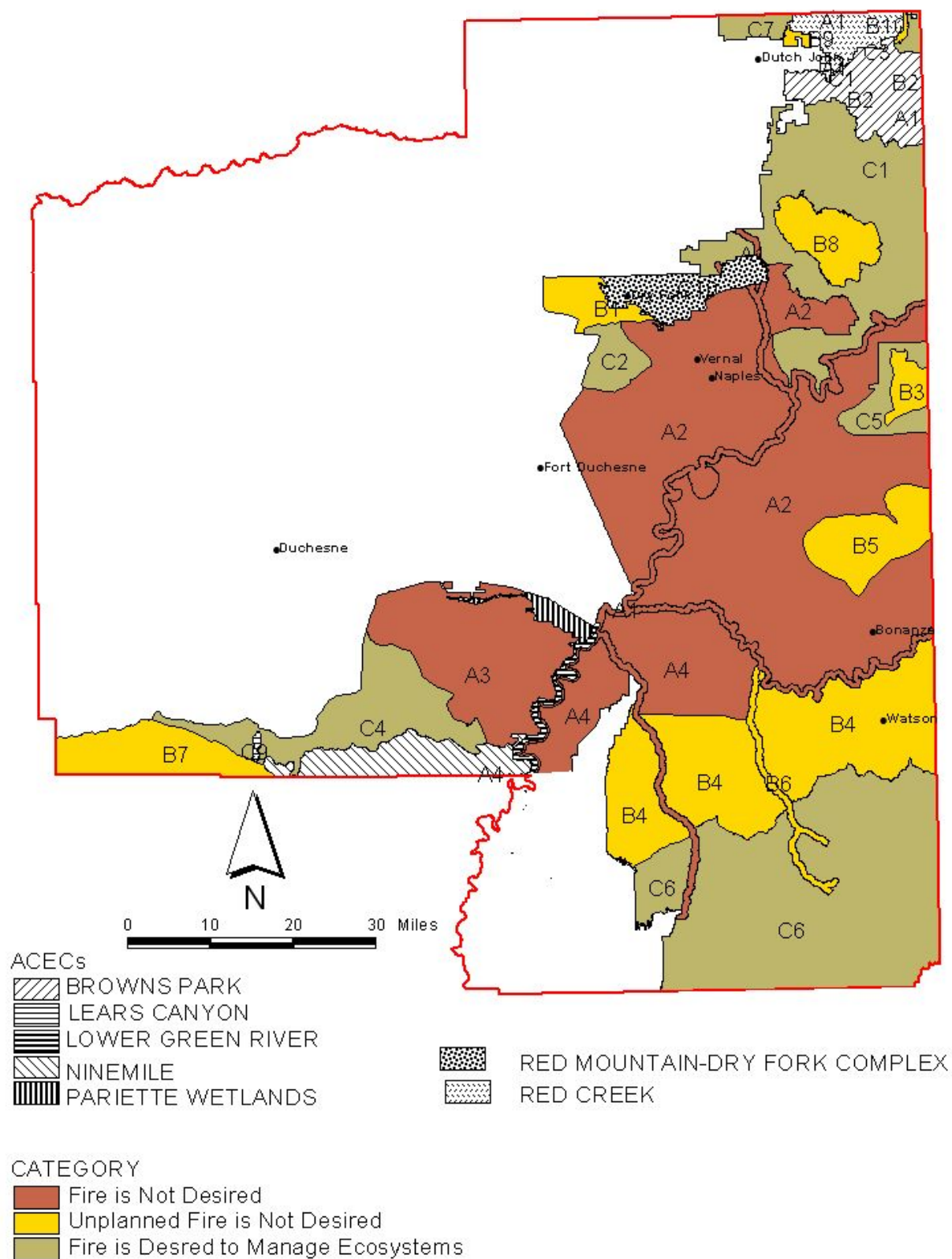
Short-term Impacts

Under No Action Alternative, short-term impacts from fire management activities would be similar to the Proposed Action. However, under the No Action Alternative, there would be fewer acres affected by wildfire, prescribed fire, and non-fire fuel treatments. This would decrease the potential for heat- and duration-related impacts for wildland fire events relative to the Proposed Action in the short term. More impacts are possible in the No Action Alternative due to ground-disturbing suppression actions. However, those impacts would be more localized if initial suppression efforts are successful. With fewer burned acres in No Action Alternative, rehabilitation actions would be less likely to impact cultural resources. Both prescribed fire and non-fire fuel treatments are smaller in acreage than in the Proposed Action, resulting in less potential for impacts from these actions.

Long-term Impacts

Because wildland fire suppression would be more aggressive, and prescribed fire and non-fire fuel treatments would be used less under the No Action Alternative, less land area would trend toward a lower FRCC. This trend away from DWFCs would move vegetation fuel loads to a condition supporting higher severity wildland fire events. Aggressive suppression efforts would be required to contain wildland fire. The long-term impact from the No Action Alternative would be an increase in the loss of historic and prehistoric resources directly from the effects of severe fire. Indirect effects to cultural resources associated with the erosion of protective soil cover would increase the likelihood of removal by collectors or structural damage due to exposure.

FIGURE 4.9: AREAS OF CRITICAL ENVIRONMENTAL CONCERN AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.3 FLOODPLAINS

Short-term Impacts

Short-term direct effects to floodplains would be similar to those seen under the Proposed Action for suppression, including ESR. However, under the No Action Alternative, there would be fewer acres affected by prescribed fire and non-fire fuel treatments. The use of federally mandated procedures, such as EO 11988, in the vicinity of sensitive areas such as floodplains would likely result in limited impacts on water quality, similarly to those anticipated in the Proposed Action. However, the No Action Alternative may provide less guidance and fewer protections with respect to activities in these areas.

Figure 4.10 presents the location of floodplain areas located in the Vernal planning area with areas categorized by relative desirability of fire.

Long-term Impacts

Under the No Action Alternative, full suppression of wildfires would remain the principal response to wildland fires. The effort to fully suppress wildfire is expected to lead to an increase in fuel loads. This may result in the increase of uncontrollable high severity fires that would degrade floodplain health and the functioning condition of watersheds. This would result in large areas of reduced vegetation cover and organic matter, degradation of sustainable stream banks, and more erosion.

Following established BLM guidelines in the vicinity of floodplains would result in limited impacts on water quality, which is similar to the Proposed Action. However, the expected increase in severe and uncontrollable wildland fires would reduce the ability to follow these guidelines, resulting in a decrease in a floodplain's natural and beneficial use during and following these events.

4.3.4 INVASIVE, NON-NATIVE SPECIES

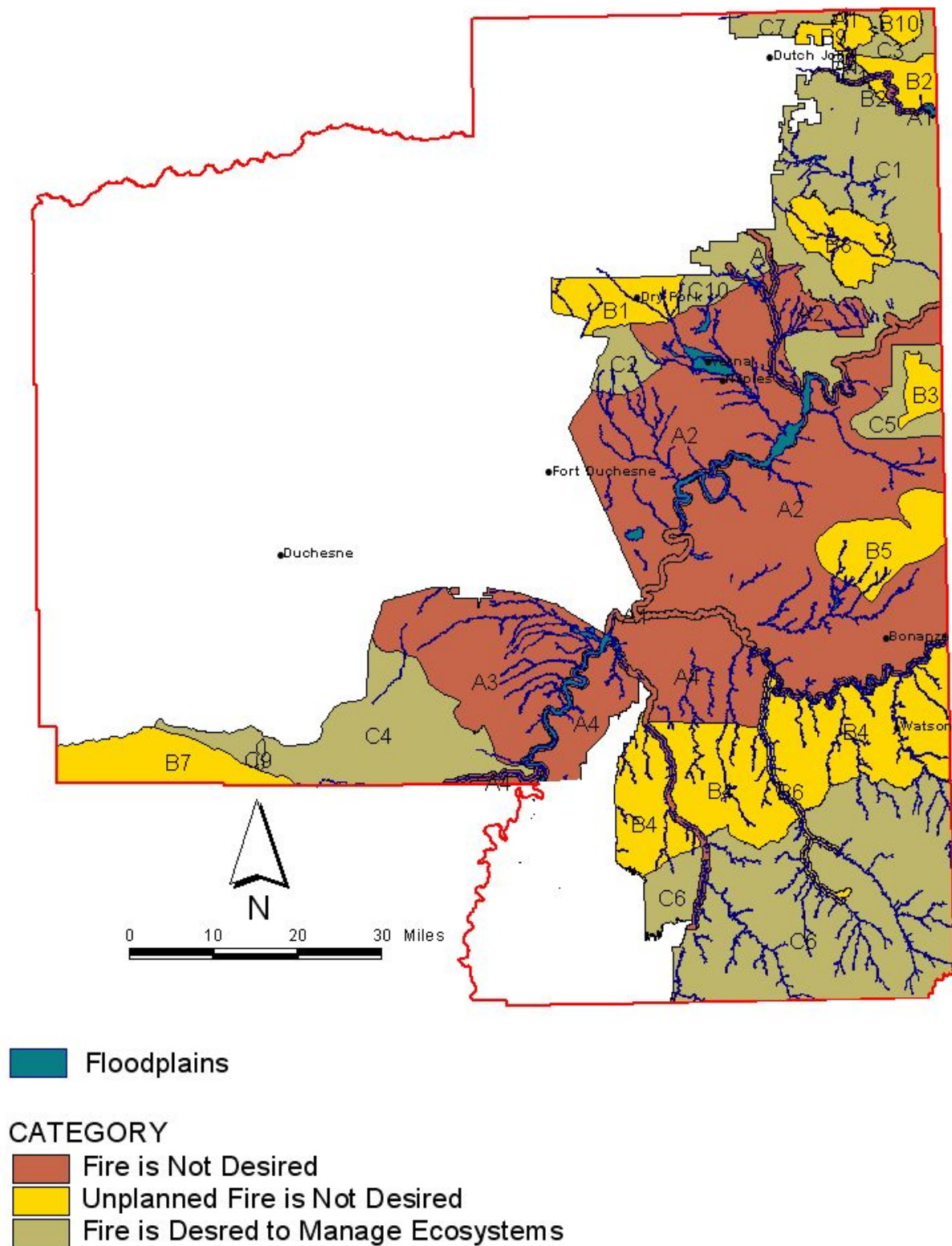
Short-term Impacts

There would likely be no effect from the No Action Alternative on invasive weeds in the short term. The fires that would affect invasive, non-native species are outside the control of BLM action in the No Action alternative. The No Action Alternative would continue the current practice of ESR actions following fire suppression minimizing encroachment of invasive, non-natives in the short term.

Long-term Impacts

Because wildland fire suppression would be more aggressive, and fewer acres would be treated with prescribed fire and non-fire fuel treatments, an increase in the range of invasive weeds is expected to continue. The likelihood of larger and more severe wildfires under the No Action Alternative would allow invasives like cheatgrass to progressively colonize new areas. More aggressive seeding and rehabilitation programs would be required to control infestations. Management actions must comply with EO 13112 (Invasive Species), however, that compliance would require greater resources to be allocated to ESR in response to fire suppression than under the management action in the Proposed Action.

FIGURE 4.10: HUNDRED-YEAR FLOODPLAINS AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.5 NATIVE AMERICAN RELIGIOUS CONCERNS

Short-term Impacts

Under the No Action Alternative, fuel loads would continue to increase. The potential for severe wildland fires would be similar to the Proposed Action. However, more aggressive wildland fire suppression under the No Action Alternative would occur, increasing the likelihood of impacts to Native American religious concerns from suppression activities. This includes the potential for impacts to vegetation use areas, traditional cultural properties, and sites used for religious and ceremonial purposes.

Wildland fire use is not allowed in the No Action Alternative, so suppression-related impacts would be greater compared to the Proposed Action. However, impacts from burning would be slightly reduced because wildland fire use is not allowed. Prescribed fire and non-fire fuel treatments would be conducted on a smaller scale. This would, in the short term, potentially decrease the impact to Native American religious concerns from ground-disturbing activities.

Long-term Impacts

With the continued buildup of hazardous fuels, wildland fire is expected to trend toward larger and more severe events. The impact of these severe events would likely include impacts to Native American religious concerns, such as alteration of vegetation composition in use areas and increased direct and indirect impacts to religious and ceremonial sites. The lack of wildland fire use and a fewer acres of planned fuel reduction treatments would exacerbate this trend. In addition, aggressive suppression efforts would be required to control impacts from severe events, increasing the potential for impacts to Native American religious concerns from ground-disturbing activities. Extensive restoration and rehabilitation actions would be required following these events potentially altering the religious value of the impacted area.

Prescribed fire and non-fire fuel treatment methods would be conducted on only about 15% of the acres than under the Proposed Action. While decreasing the impact to Native American religious concerns from ground-disturbing activities, it would exacerbate the trend toward an increase in dangerous fuel loads. This would result in larger more severe fires and more aggressive suppression efforts to contain them.

4.3.6 SPECIAL STATUS SPECIES

Short-term Impacts

Under the No Action Alternative, the BLM would continue its current fire management practices. The BLM would still be required to Section 7 consultation with USFWS for all site-specific fire management activities if they would be implemented within suitable or potentially suitable habitat for federally listed species. The Alternative Consultation Agreement to Implement Section 7 Counterpart Regulations could be employed for consultation on projects that support the National Fire Plan.

Because wildland fire suppression under the No Action Alternative would be more aggressive compared to the Proposed Action, short-term impacts from burning could be less. Conversely, there would be greater suppression-related impacts in the No Action Alternative.

Though prescribed fire and non-fire fuels treatment would be limited under the No Action Alternative, short-term impacts would be similar to those under the Proposed Action. Both alternatives would require consultation with the USFWS, which would help ensure protection of species and their habitat, prior to implementation of fire management activities. Accordingly, few adverse impacts to species (plant and animal) and their habitat would likely occur.

Long-term Impacts

Long-term ecosystem-wide beneficial effects of the Proposed Action on SSS and their habitat would not be attained under the No Action Alternative. With implementation of aggressive suppression efforts and a lack of fire and non-fire fuel treatments, fuel loading would continue to increase and the subsequent risk of a severe wildland fire would increase. Indirect adverse effects (from changes in vegetation composition and structure caused by aggressive fire suppression and potentially severe wildland fires) to individuals, populations, and habitats would continue.

4.3.7 WATER QUALITY

Short-term Impacts

Surface Water

Surface water would be at risk from soil disturbance and increased erosion potential related to fire suppression activities such as fireline construction, road construction and other uses of heavy equipment. This may result where wildfires are suppressed in an aggressive and focused manner, versus the Proposed Action, where lower severity and non-resource threatening fires may undergo limited suppression efforts.

Figure 4.11 presents the location of 303(d)-listed waterbodies located in the Vernal planning area relative to polygons categorized in the No Action Alternative by relative desirability of wildland fire in the area. Most 303(d)-listed impaired waters in the Vernal planning area are not located on BLM-administered land. Those that are located on BLM-administered land are primarily located in polygons where fire is generally not desirable.

The No Action Alternative will follow regulations for protecting 303(d)-listed impaired water bodies, as in the Proposed Action, and would therefore result in limited impacts. However, the No Action Alternative would provide less guidance and fewer restrictions (since RPMs were not developed) resulting in possibly slightly greater impacts.

Groundwater

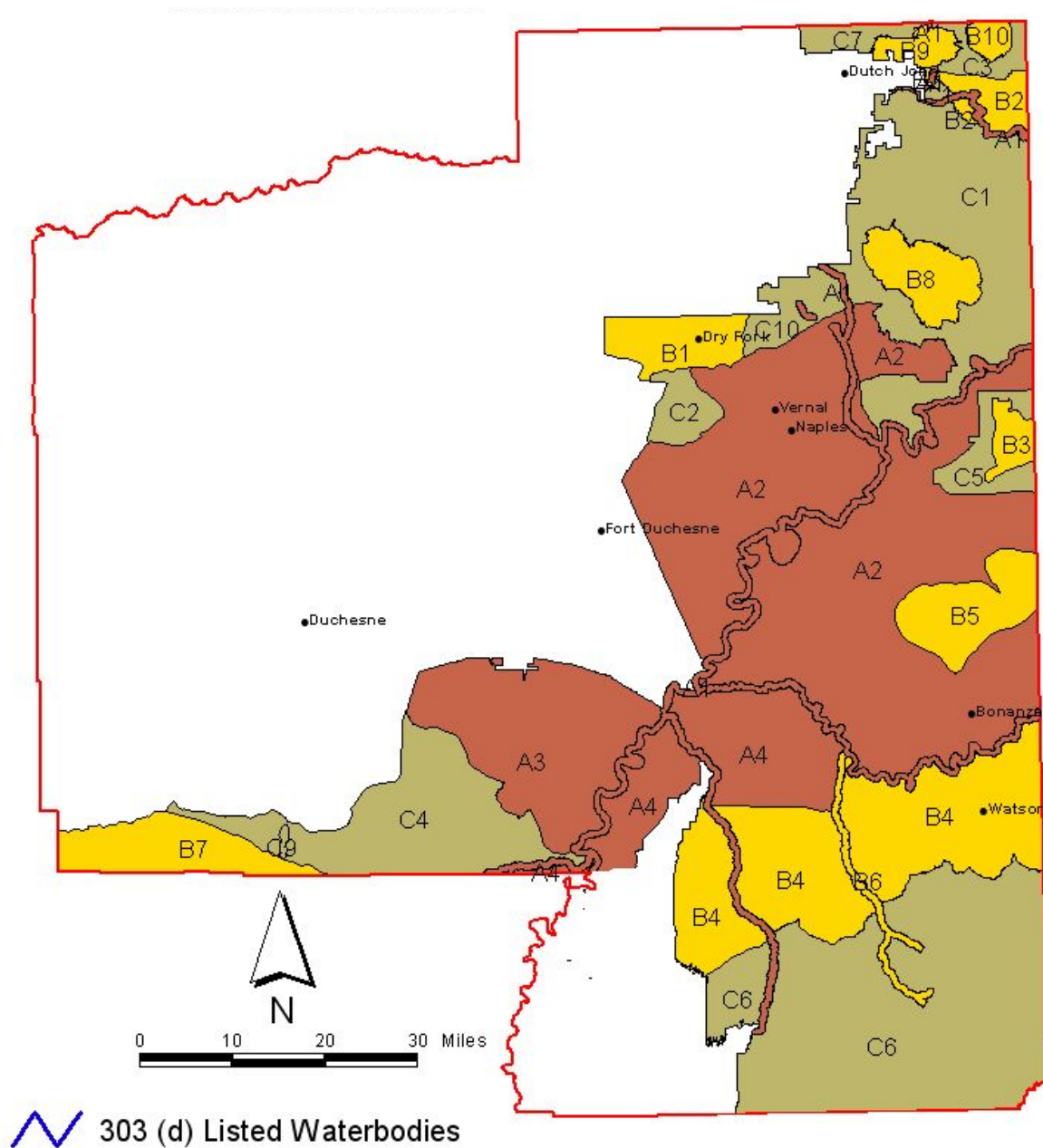
Short-term effects to groundwater would be similar to the Proposed Action for wildland fire suppression, prescribed fire, and non-fire fuels treatments. No acres have been identified for wildland fire use under the No Action Alternative.

Long-term Impacts

Surface Water

Surface water resources would trend toward greater impacts under the No Action Alternative. Full suppression of wildfires would remain the principal response to wildland fires. The effort to fully suppress wildfire could lead to an increase in fuel loads. This may result in the increase of uncontrollable high-severity fires, which could increase the loss of vegetation cover and organic matter, increase degradation of sustainable stream banks and widths, and result in more erosion. Long-term effects could also include increases in dissolved and suspended solids, nutrients and temperature variations outside of normal conditions.

FIGURE 4.11: 303(D)-LISTED WATERBODIES AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



CATEGORY

- Fire is Not Desired
- Unplanned Fire is Not Desired
- Fire is Desired to Manage Ecosystems

The increase in high severity fires could decrease the amount of precipitation able to infiltrate into the subsurface, promoting run-off and erosion. Water that does infiltrate to the subsurface could have an increased nutrient load obtained as it passes through burned vegetation and physiochemically altered shallow soils resulting in chemical alterations of groundwater.

4.3.8 WETLANDS AND RIPARIAN ZONES

Short-term Impacts

Short-term impacts on riparian areas and wetlands would be similar to those described under the Proposed Action. However, under the No Action Alternative, there would be fewer acres of prescribed fire, non-fire fuel treatments and fewer acres of wildland fire since wildland fire use would not be allowed and wildfire suppression would be more aggressive.

Because the No Action Alternative lacks specific RPMs, negative impacts to riparian areas and wetlands could result. Short-term impacts of suppression activities could include vegetation damage or destruction, increased erosion, and increased sedimentation in streams. This loss of streamside vegetation could increase stream temperature and degrade aquatic habitat.

Vegetation disturbance associated with prescribed fire and non-fire fuel treatments would be evaluated through site-specific analysis that would minimize impacts related to vegetation loss and increased erosion. Often, these impacts are short-term, and conditions return to pre-fire levels once vegetation is re-established. Efforts would be made to protect vegetation and restore native species after a disturbance reducing the potential for impacts.

Long-term Impacts

Under the No Action Alternative, suppression of wildfires would remain the principal response to wildland fires. The effort to suppress wildfire could lead to an increase in fuel loads. This may result in the increase of large or severe wildland fires, which could increase the loss of vegetation cover and organic matter, degrade banks, and increase erosion in riparian and wetland areas.

4.3.9 WILD AND SCENIC RIVERS

Short-term Impacts

Short-term impacts from the No Action Alternative would be similar to those described under the Proposed Action. The increased emphasis on suppression and the lack of RPMs could lead to more severe short-term impacts than those anticipated by the Proposed Action. Additionally, the greater focus on suppression efforts could potentially decrease the amount of river segment acres that burn. Fewer burned or treated acres may give the impression of a more natural environment to the public, when the lack of these treatments causes negatively impacts the health of riparian and wetland areas.

Long-term Impacts

This alternative would result in trends toward higher fuel loadings in or around eligible river segments. If heavy fuel loads were ignited, a high severity fire could damage values associated with wild, and wild and scenic designations. Suppression efforts to protect these areas may increase impacts on the values present. This may involve the occurrence of ground-disturbing activities in and around the eligible river segment,

including fire camps and firelines. Excluding fire from playing its natural role in ecosystems, as set forth in the No Action Alternative, would negatively impact long-term wild and scenic river characteristics.

4.3.10 WILDERNESS STUDY AREAS

As shown in **Figure 4.12**, the majority of Wilderness Study Area (WSA) acres occur in Category C. Management activities would be designed to minimize impacts on wilderness suitability of WSAs and would follow WSA guidelines and policies.

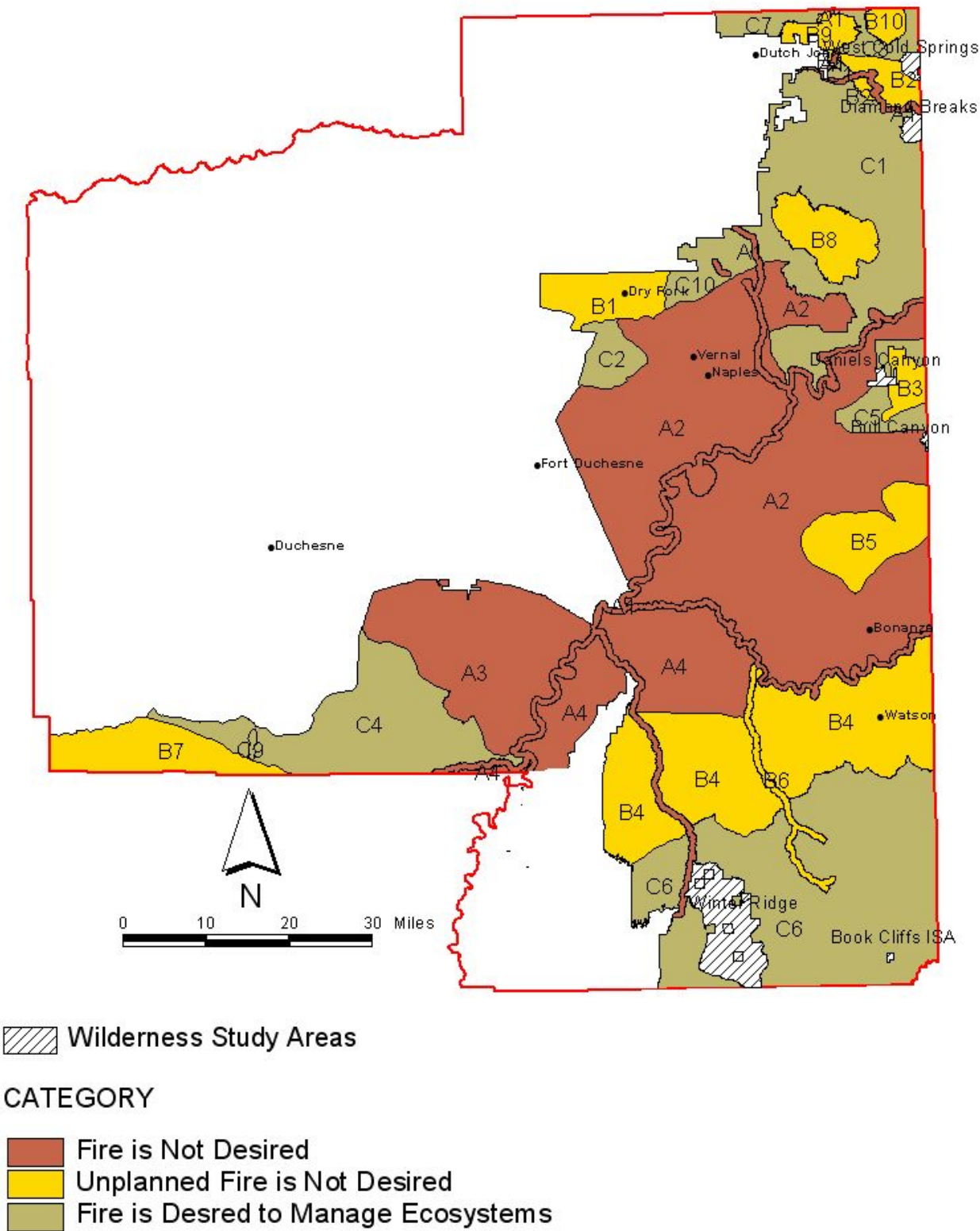
Short-term Impacts

The impacts from the No Action Alternative would be similar to the proposed Action. Although the No Action Alternative would comply with WSA guidelines and policies, there would be fewer opportunities to restore fire to its natural role in the No Action Alternative since wildland fire use is not allowed. Impacts from prescribed fire and seeding treatments would be similar since management actions would undergo site-specific analysis. Mechanical treatments would not be appropriate for WSAs. Opportunities for solitude and primitive recreation would result in very short-term impacts while suppression or treatment efforts are taking place.

Long-term Impacts

Continued lack of fire in WSAs would perpetuate the build-up of unnatural and unsustainable fuel loads. If heavy fuel loads were ignited, a high-severity fire could damage resources such as soil, vegetation, and vegetation screening, and wildlife resources that are part of WSAs. Opportunities for solitude and primitive recreation associated with WSAs would be negligibly impacted. Suppression efforts implemented to protect these areas could increase impacts to the values present. This could involve the occurrence of ground-disturbing activities (e.g., from construction of firelines) in WSAs.

FIGURE 4.12: WILDERNESS STUDY AREAS AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.11 LIVESTOCK GRAZING

Short-term Impacts

Figure 4.13 presents the locations of the grazing allotments relative to fire management categories and their associated impacts from wildland fire suppression and wildland fire.

Under the No Action Alternative, short-term impacts of fire management activities would be less than the Proposed Action, with the potential exception of suppression-related impacts. The lower level of wildland fire and planned fuel treatments accounts for this decrease in impacts. Suppression-related impacts would potentially be larger due to the more aggressive goal of suppressing wildland fires at a smaller acreage; however, these impacts would occur on a relatively small scale. These relative decreases in impacts would include less impact on allotment use and range improvements.

Long-term Impacts

Under the No Action Alternative, less land area would trend toward a lower FRCC. This trend away from DWFCs would move vegetation fuel loads to condition supporting higher severity wildland fire. This would lead to increased loss of allotment use than under the Proposed Action, due to the loss of seed banks and physical and chemical degradation of soil that would prolong recovery after wildfire. Larger, more severe wildfires would also result in more negative impacts to allotment improvements. The long-term impact from the No Action Alternative would trend toward more economic and forage impacts to permittees and livestock.

4.3.12 WOODLANDS AND FORESTRY

Short-term Impacts

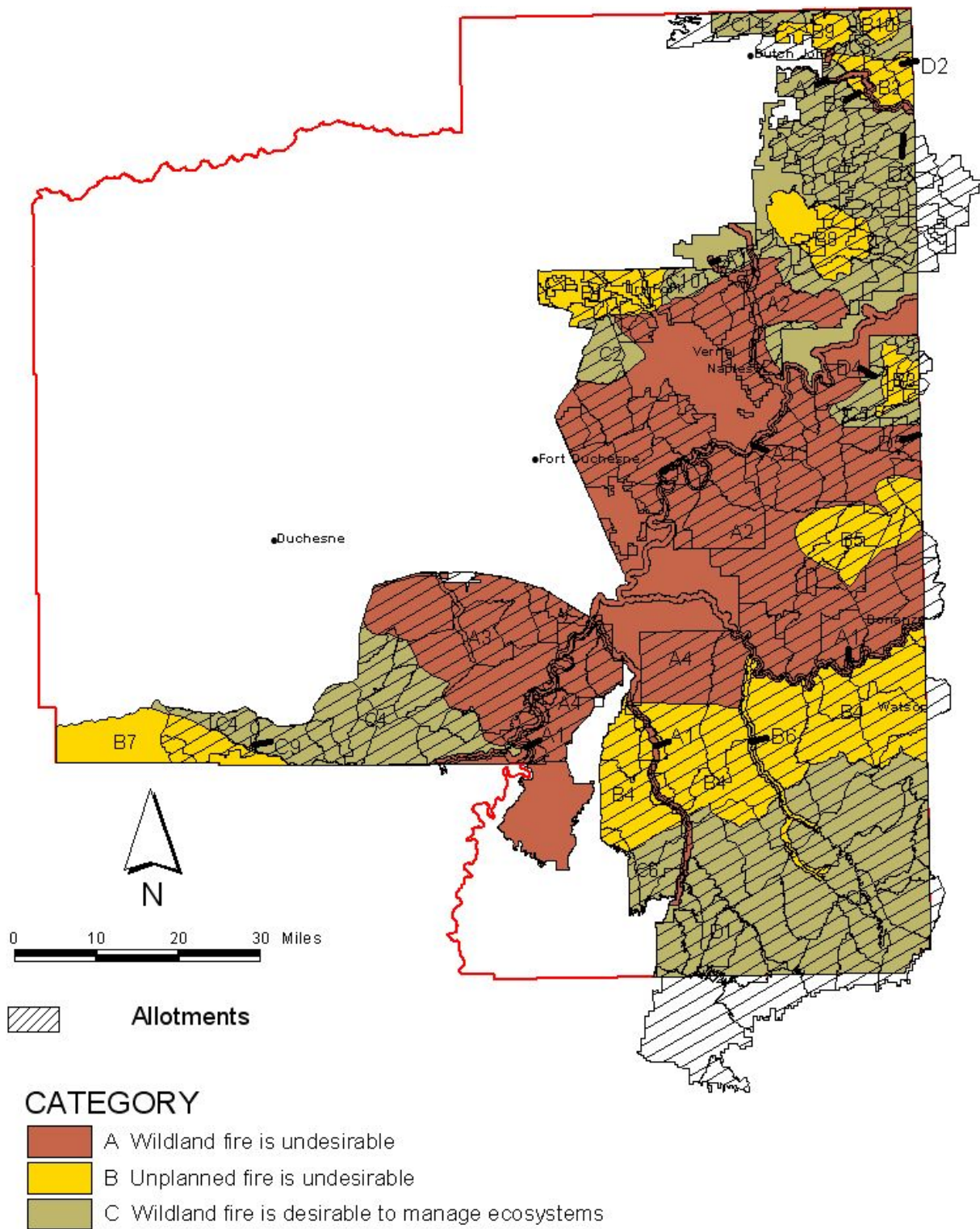
The No Action Alternative would continue current trends of fuel accumulation and juniper encroachment through limited use of wildland fire and fuel treatments. The No Action Alternative allows for limited prescribed fire and non-fire fuel treatments. Therefore, impacts to opportunities for biomass and firewood harvest would be slightly reduced from the Proposed Action.

Long-term Impacts

Long-term impacts from the wildfire suppression efforts would increase the acres of pinyon and juniper encroaching on land outside of its historic range and acres within its historic range where they have become the dominant species. This would directly decrease the availability of biomass and firewood collection in this vegetation type. This impact would be less pronounced in other forested areas. Fewer protections for old-growth forests would be in place under this alternative, resulting in potential impacts to old-growth.

Although limited prescribed fire and non-fire treatments would initially result in an increase in the opportunity for the harvesting of biomass and firewood, a trend toward less biomass availability would eventually occur due to larger and more severe wildland fires in forests and woodlands.

FIGURE 4.13: GRAZING ALLOTMENTS AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.13 VEGETATION

Figure 4.14 shows vegetation types relative to the polygon categories. Effects are described under each type. **Appendix I** describes the general effects of fire on resources.

Short-term Impacts

Salt Desert Shrub: Impacts would be similar to the Proposed Action Alternative since fire and non-fire treatments would play a small role in this vegetation type in both alternatives. Aggressive fire suppression would occur in both alternatives and associated suppression impacts would be similar.

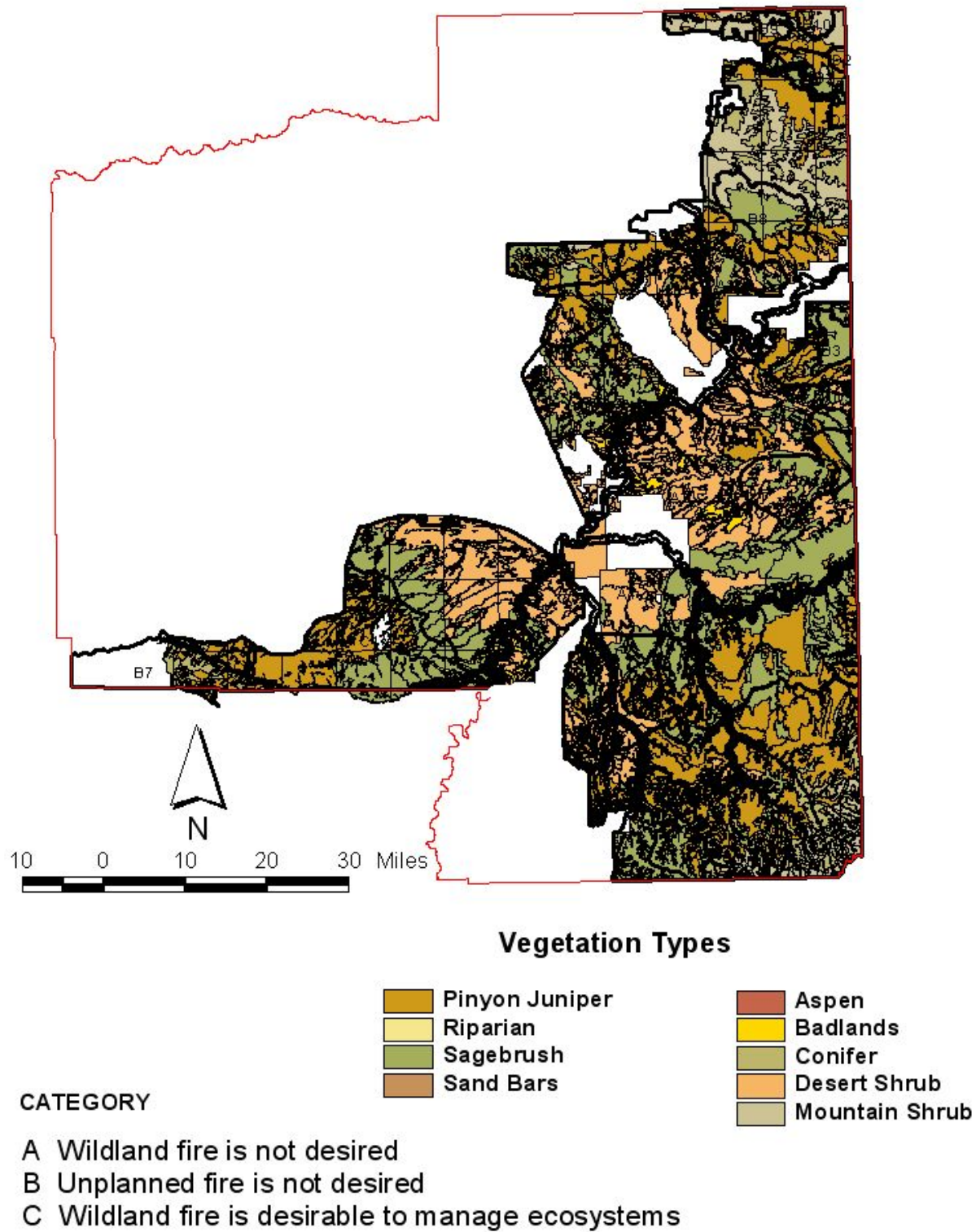
Sagebrush, Pinyon/Juniper, Mountain Shrub, Mixed Conifer, Aspen: The No Action Alternative would have more aggressive fire suppression in these vegetation types, compared to the Proposed Action Alternative that recognizes the beneficial role of fire in some of these areas. The No Action Alternative would have increased impacts from fire suppression actions. The No Action Alternative would have no impacts from wildland fire use since it is not allowed.

The No Action Alternative would have slightly decreased prescribed fire and non-fire fuel treatment acres. Therefore, negative impacts associated with vegetation removal would be reduced and occur in smaller areas. Conversely, beneficial impacts of promoting diverse vegetation species and structure would be reduced.

Long-term Impacts

In all vegetation types, acres of fire being restored to the ecosystem would be much smaller than the Proposed Action and non-fire fuel treatments and prescribed fire would be limited. Trends toward increasing hazardous fuel loads would continue, resulting in increased risk of large, severe wildfires. Larger, more severe wildfires would result in greater potential for invasive species establishment and risk of undesirable vegetation conversions.

FIGURE 4.14: VEGETATION TYPES AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.14 FISH AND WILDLIFE

Short-term Impacts

The No Action Alternative would have more aggressive suppression than the Proposed Action resulting in more impacts from fire suppression efforts. Short-term impacts (e.g., introduction of fire retardant and/or foam into the ecosystem, habitat modification, plant mortality, and/or displacement of animal individuals or populations) from actual suppression activities would be slightly greater. There would be no impacts from wildland fire use since that would not be allowed in this alternative.

Less direct, adverse impacts to fish and wildlife species and their habitat would occur from prescribed fire and non-fire fuel treatments since these actions would occur on fewer acres in the No Action Alternative. Impacts from planned actions would be considered in site-specific analysis the same was as in the Proposed Action Alternative.

Long-term Impacts

Impacts from more aggressive wildland fire suppression and lack of vegetation treatments include the trend toward more severe and larger wildland fires. Larger and more severe fires would increase the potential for noxious weed establishment over large areas, thereby modifying wildlife habitat (particularly habitat that would otherwise provide forage resources). Adverse impacts (from long-term changes in vegetation composition and structure caused by aggressive fire suppression and potentially severe wildland fires) to individuals, populations, and habitats would continue.

4.3.15 SOILS

Short-term Impacts

The No Action Alternative would provide minimal soil protection guidance for fire management actions. Due to more aggressive suppression, impacts to soils from fire suppression actions would be higher in this alternative. However, impacts from wildland fire would be slightly reduced since fires would be suppressed more aggressively and wildland fire use wouldn't be allowed. Fire suppression impacts include soil disturbance and compaction. There would be fewer soil-related impacts from prescribed fire and non-fire fuel treatments since those actions would occur on fewer acres in the No Action Alternative.

Long-term Impacts

Because suppression would be more aggressive, and prescribed fire and non-fire fuel treatments occur less, wildland fires under the No Action Alternative would become increasingly larger and more severe, resulting in a greater occurrence of negative impacts to soil resources. High-severity fires would remove more of the vegetation cover and organic matter, reducing nutrient cycling. Increases in physiochemical alteration and decreases in plant-available moisture in shallow soils could occur. High-severity wildfires are also more likely to adversely affect soil microorganisms, decreasing biological crusts that prevent erosion and fix nitrogen from the atmosphere. High-severity fires may also result in formation of water-repellent soil layers (Robichaud et al. 2000), which can decrease infiltration and increase the rate and quantity of runoff, causing accelerated erosion and potentially dangerous debris flows. The degree of water repellency in soils following a fire is positively correlated with fire severity. These impacts would decrease the ability for soil to foster the beneficial uses of natural vegetative growth and wildlife habitat.

4.3.16 RECREATION

Short-term Impacts

The impact to recreational sites and facilities from wildland fire suppression under the No Action Alternative would be slightly greater than the Proposed Action. However, because suppression would be more aggressive, there would be less risk to damaging recreation infrastructure. Fewer acres of prescribed fire and non-fire fuel treatments, particularly surrounding sites and facilities, would create an increasing trend of hazardous fuel loads compared to the Proposed Action. In the short-term, recreationists would be impacted less under the No Action Alternative since management actions would be less.

Long-term Impacts

Because suppression would be more aggressive, and prescribed fire and non-fire fuel treatments occur less, wildland fires under the No Action Alternative would become increasingly larger and more severe, resulting in a greater occurrence of negative impacts to recreation.

4.3.17 SOCIOECONOMICS

Short-term Impacts

Short-term impacts would include continued risk to communities at risk and WUI areas from wildland fire events since WUI protection is not recognized in the No Action Alternative. Because of more aggressive wildfire suppression, grazing permittees would be impacted slightly less than in the Proposed Action where more wildland fire acres would occur. Economic losses, associated with a decrease in available forestry products, would be slightly less in the No Action Alternative.

Long-term Impacts

Aggressive fire suppression could result in an increase in payroll benefits for suppression forces, particularly in the long term, with the increased potential for severe wildland fire. The loss of grazing allotment use and forest product harvesting opportunities would increase with time as severe wildland fire events become more frequent. Forest product harvesting opportunities for pinyon nuts, firewood, and other products would decrease, as would the associated economic benefits to local residents, as these harvesting areas are altered with the trend toward large and severe wildland fire events.

4.3.18 WILD HORSES AND BURROS

Short-term Impacts

Figure 4.15 presents locations of the HMAs relative to fire management categories.

Under the No Action Alternative, short-term impacts of fire suppression would be slightly greater than the Proposed Action. Less forage loss would occur and the associated displacement of animals would be reduced because wildfires would be smaller and no wildland fire use would be allowed. Impacts from prescribed fire and non-fire fuel treatments would be slightly less under this alternative because those treatments would occur on fewer acres.

Long-term Impacts

Long-term effects from continued fire suppression would trend vegetation toward an increased hazardous fuel load leading to larger, more severe wildland fires. These severe wildland fire events have the potential to

make forage unavailable for longer periods of time than lower severity fires and would increase potential for invasive species establishment. This would cause displacement of the herds potentially out of the designated management areas and increase the likelihood that remaining herds would damage fragile soil and recovering vegetation.

4.3.19 WILDERNESS CHARACTERISTICS

Figure 4.16 displays lands with wilderness characteristics and fire management categories.

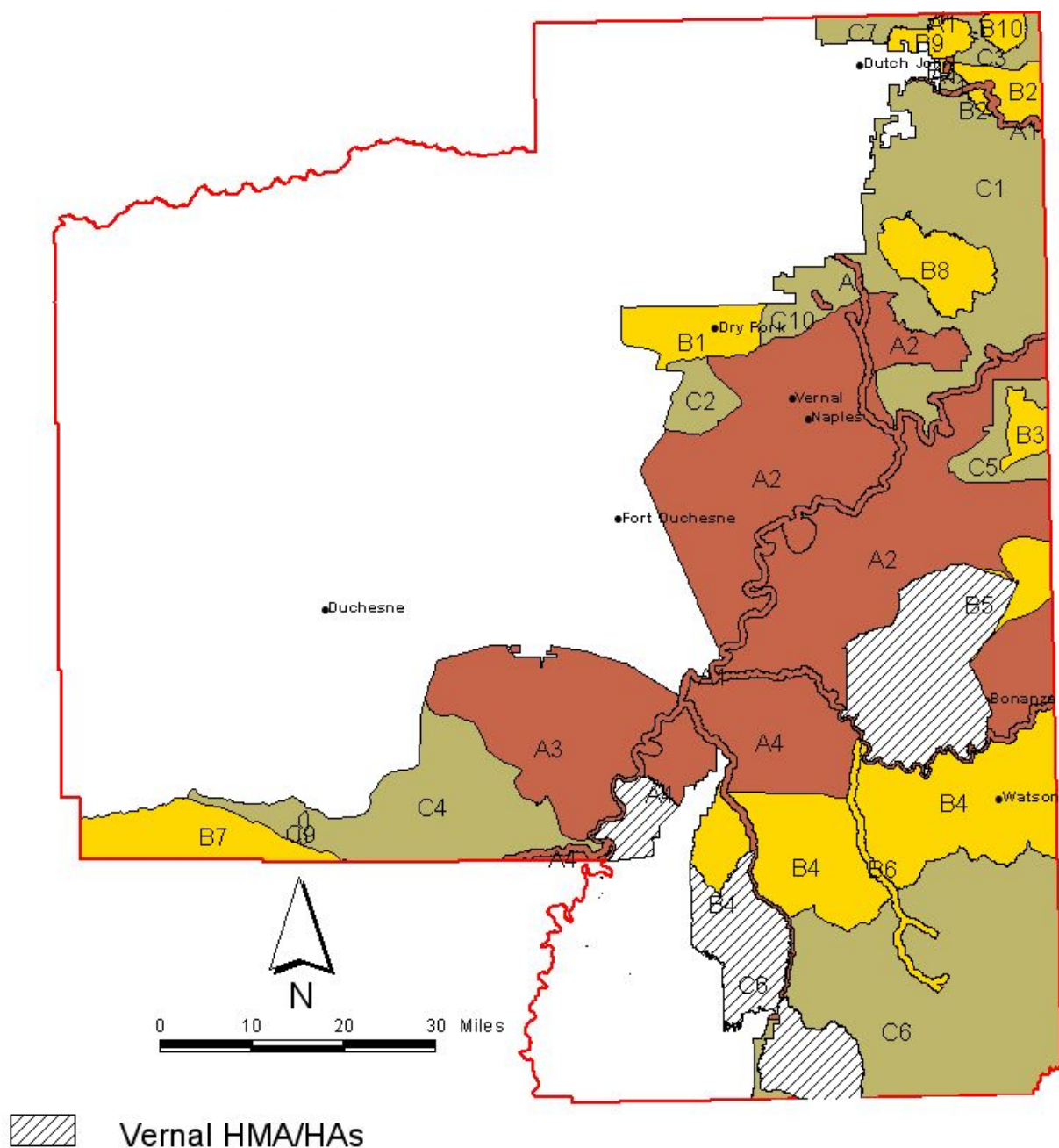
Short-term Impacts

Impacts from existing fire management direction would be similar to those described under the Proposed Action. The increased emphasis on suppression, and the lack of updated RPMs, could lead to more severe short-term impacts than those that would occur under the Proposed Action. However, the greater focus on suppression efforts could potentially decrease the acreages that would burn. There would be no impacts from wildland fire use since it is not allowed in this alternative, and fewer impacts from prescribed fire and non-fire fuel treatments because treatments would occur on fewer acres.

Long-term Impacts

The lower amount of planned fuel treatments under the No Action Alternative would perpetuate the build-up of hazardous fuel loads. When heavy fuel loads are ignited, a high-severity fire could damage resource values (e.g., opportunities for solitude and primitive recreation) associated with areas with wilderness characteristics and areas likely to have wilderness characteristics. Suppression efforts implemented to protect these areas could increase impacts to the values present. This could involve the occurrence of ground-disturbing activities (e.g., from construction of fire camps and firelines) in areas with and likely to have wilderness characteristics.

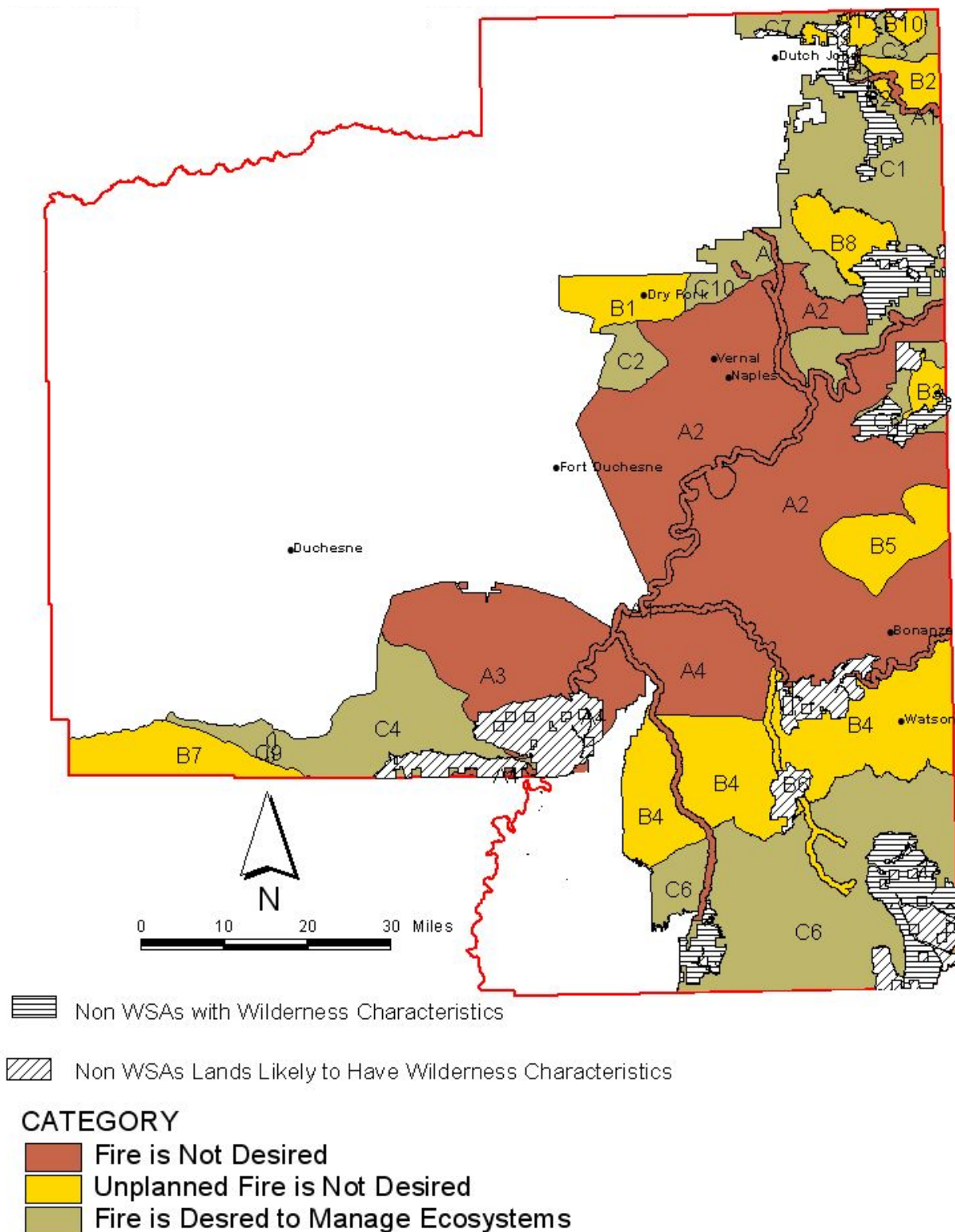
FIGURE 4.15: HERD MANAGEMENT AREAS, HERD AREAS, AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



CATEGORY

- Fire is Not Desired
- Unplanned Fire is Not Desired
- Fire is Desired to Manage Ecosystems

FIGURE 4.16: NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS, NON-WSA LANDS LIKELY TO HAVE WILDERNESS CHARACTERISTICS, AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.4 CUMULATIVE EFFECTS

4.4.1 REASONABLY FORESEEABLE ACTION SCENARIO

The following reasonably foreseeable action scenario (RFAS) identifies the cumulative actions that would cumulatively affect the same resources in the cumulative impact area as the Proposed Action and alternatives.

- National Fire Plan activities for all surrounding federal and many state land management agencies
- Land and resource management plan revisions in Utah BLM as well as in Utah's National Forests.
- Continuing implementation of the Standards for Rangeland Health and Guidelines for Grazing
- Continuing implementation of vegetation treatment on BLM lands in 13 Western states (BLM 1991) and upcoming Vegetation EIS (ongoing planning)
- Regulatory actions, guidance and associated revisions for sagebrush restoration and grazing on public lands
- Vegetation treatment resulting from wildlife mitigation projects (big game winter range, sage grouse habitat restoration)
- TMDL planning
- Air quality degradation or improvement
- Continued increase in WUI
- Increase in recreational use of BLM lands
- Continued expansion of mineral extraction activities including oil and gas
- Ongoing growth and development throughout the planning area
- New coal-fired power plants
- Utility corridor development
- Continued and increased noxious weeds infestation on lands adjoining lands administered by BLM
- Continued human-caused and natural ignitions

4.4.2 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Proposed Action

Past management and environmental actions, including changes in vegetation conditions and the resulting modification of fire regimes, have resulted in an existing environment that is much different than the historical condition. Likewise, a variety of political and regulatory management directives associated with safety considerations and other resource needs, affect how the role of fire and fuels management has been applied within these areas.

The overall effect of the Proposed Action toward DWFC, together with reasonably foreseeable actions, would be a reduction of potential impacts from wildland fire. This would help to maintain the naturalness of ACECs by allowing wildfire to play its natural role in the ecosystem, and helping to protect the special values of ACECs. The Proposed Action would allow flexibility in fire and fuels management that would accommodate increased human use and subsequent impacts.

No Action Alternative

Cumulative effects of the No Action Alternative could lead to more intense suppression actions, adversely impacting unique values associated with ACECs by continuing the trend toward fuel loading. This would pose a greater threat (from severe wildland fire) than the Proposed Action on historic, cultural, and scenic values associated with ACECs. These impacts would be exacerbated by reasonably foreseeable actions, and would contribute to adverse impacts that the No Action Alternative would have on ACECs.

4.4.3 CULTURAL RESOURCES

Proposed Action

Full-suppression fire management techniques used prior to the current fire management actions have altered the natural fire regime and allowed preservation of historic-aged resources where they otherwise would have been consumed under more natural wildland fire conditions

Reasonably foreseeable actions include increased mineral development activities, utility corridor development, vegetation treatments, and recreational use on and WUI expansion adjacent to BLM-administered lands. Impacts to cultural resources from these would include an associated increase in vandalism, artifact collection, and destruction.

The Proposed Action would reduce impacts that wildland fire and wildland fire suppression have on cultural resources in the long term. However, in the short term more artifacts may be revealed due to an anticipated increase in annual wildland fire-suppression goals. Cumulative effects activities would add to the disturbance, possible destruction, or removal of cultural artifacts. Existing regulations and protocols should help reduce the impacts on cultural resources.

No Action Alternative

No Action Alternative would, in the long term, increase impacts that wildfire and wildfire suppression may have on cultural resources. Cumulative effects activities would add to the disturbance or removal of artifacts and would increase the amount of ground-disturbing suppression activities that would alter areas already being impacted by OHV use, such as sections of historic trails. Potential loss of cultural resources through mineral development, vegetation treatments, utility corridor development, and WUI expansion would exacerbate the loss of these resources through fire-suppression actions.

4.4.4 FLOODPLAINS

Proposed Action

Effects of the Proposed Action on floodplain resources are closely associated with and similar to effects to soil, water, and wetlands and riparian area resources. Cumulative effects from activities such as land development and recreational use, as well as encroachment of noxious weeds, would continue to have negative effects on floodplain resources. The implementation of guidance on grazing, water quality (TMDLs), OHV use, and the National Fire Plan would improve the floodplain resources when combined with the long-term effects of the Proposed Action.

No Action Alternative

Cumulative effects of the No Action Alternative would generally have negative effects on floodplain resources due to the increasing trend toward more severe wildfires. Large-scale implementation of the National Fire Plan by other agencies and improvements made when resource impacts are reduced through

regulation would have the same positive benefits as described under the Proposed Action. Overall, however, the long-term trend would be toward a degradation of floodplain resources and increased alteration of natural hydrologic systems.

4.4.5 INVASIVE, NON-NATIVE SPECIES

Proposed Action

Noxious weed spread and introduction as a result of increased recreational use, continued grazing, and future development for mineral extraction would have a negative impact on vegetation throughout the Vernal planning area. However, the Proposed Action would contribute to the overall improvement of health within vegetation communities and make them more resistant to invasion from noxious weeds.

No Action Alternative

Increased recreational use, continued grazing, and future development for mineral extraction may contribute to the continued spread and introduction of noxious weeds, which would exacerbate the problems caused by No Action Alternative regarding cheatgrass invasion.

4.4.6 NATIVE AMERICAN RELIGIOUS CONCERNS

Proposed Action

Reasonably foreseeable actions include increased recreational use, utility corridor development and mineral resource development in areas containing Native American religious concerns. This would include an associated increase in alterations to the facets of a landscape valued in Native American religious beliefs and practices.

The Proposed Action would reduce impacts that wildland fire and wildfire suppression have on Native American religious concerns including traditional cultural properties in the long term; however, in the short term, more of the associated values and sites may be impacted due directly to wildland fire. Cumulative effects activities would add to vegetation disturbances. Consultation with tribes prior to planned fuel management activities would help offset increasing impacts from other uses..

No Action Alternative

The No Action Alternative would, in the long term, increase impacts to Native American religious values and traditional cultural properties. Impacts from larger fires, coupled with increased development would impact traditional cultural properties, and lead to impacts to TCPs. Cumulative effects activities would add to vegetation disturbance that may alter attributes Native American's consider important in the practice of religious beliefs. Consultation with tribes prior to planned fuel management activities would help offset increasing impacts from other uses..

4.4.7 SPECIAL STATUS SPECIES

Proposed Action

Overall hazardous fuel reductions associated with large-scale implementation of the National Fire Plan on adjacent lands would gradually reduce the risk of a severe wildland fire event and restore ecosystems that would reflect vegetation composition more consistent with a natural fire regime.

Since management actions would be planned to avoid and minimize impacts on SSS and their habitat, the Proposed Action coupled with reasonably foreseeable actions would result in minimal short-term adverse impacts. These short-term impacts would be offset by long-term beneficial effects of rehabilitation activities. Such activities include: large scale implementation of the National Fire Plan, the Vegetation EIS, and Utah Rangeland Health and Guidelines for Grazing Management; and reduction of the fuel load following prescribed fire, non-fire fuel treatments or wildland fire use. The subsequent, gradual return to a more natural fire regime would result in long-term beneficial effects. Hazardous fuels would be reduced, which would reduce the risk of large, catastrophic fire events and habitat alteration.

No Action Alternative

Overall hazardous fuel reductions associated with the large scale implementation of the National Fire Plan on adjacent lands would gradually reduce the risk of a severe wildland fire event and restore ecosystems that would reflect historical vegetation composition. However, negative impacts would be more pronounced on BLM-administered land.

4.4.8 WATER QUALITY

Proposed Action

The effects of the Proposed Action on water quality would include improvements in watershed health, such as an increased supply of woody debris or stream bank vegetation and increased stream bank and channel stability. Cumulative effects from recreational use and noxious weeds would continue to have negative sediment load effects. The implementation of water quality (TMDLs) regulations, rangeland health standards and guidelines, restrictions on OHV use, and large-scale implementation of the National Fire Plan by other agencies would improve the water quality and supply when combined with the long-term effects of the Proposed Action.

No Action Alternative

Effects of the No Action Alternative would generally have negative effects on water quality, largely due to the trend toward increasingly severe wildfires. Infiltration may be increased or reduced, affecting runoff and groundwater. Similar to the Proposed Action, implementation of the National Fire Plan, TMDLs, and rangeland health standards and guidelines would benefit water quality. Despite these benefits, the overall long-term trend resulting from increasingly severe wildland fire would be toward a degradation of water quality and increased alteration of natural hydrologic systems.

4.4.9 WETLANDS AND RIPARIAN ZONES

Past management and environmental actions, including changes in vegetation conditions and the resulting modification of fire regimes, have resulted in an existing environment that is much different than the historical condition. Alterations from water diversion, water impoundment, stream channelization, dewatering, timber and grazing practices, and the invasion of nonnative and noxious vegetation species, have considerably altered riparian and wetland conditions and adversely impacted functional capacities.

Proposed Action

Cumulative effects on riparian resources would include an increase in soil stability, a more sustainable supply of woody debris or stream bank vegetation, an improvement in native vegetation composition and bank/channel stability, and an increased functionality of riparian areas. Cumulative effects from recreational use could continue to adversely impact aquatic habitats by causing higher sediment loads). However, implementation of management guidance on grazing, recreation, and OHV use, and vegetation treatments

would cumulatively improve the overall health and quality of riparian areas when combined with implementation of the Proposed Action.

No Action Alternative

Effects of the No Action Alternative would be similar to those described under the Proposed Action but with greater potential for adverse impacts (based on the lack of updated RPMs and a higher risk of severe wildland fire). Recreation and grazing practices could potentially damage vegetation further and cause increased erosion as well.

4.4.10 WILD AND SCENIC RIVERS

Proposed Action

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than the historical condition. Likewise, a variety of political and regulatory management constraints associated with other resource needs and safety considerations affect how the role of fire or non-fire fuels management can be applied along these river segments.

Reasonably foreseeable actions would lead to additional human pressure on rivers, more use of these areas, an increase in noxious weed spread, and the potential for human-caused fires to affect the areas as use increases.

No Action Alternative

Effects of the No Action Alternative could lead to more intense suppression actions adversely impairing the unique values associated with river segments, continue the trend toward larger fuel buildups in and around river segments possibly damaging historic, cultural or scenic values associated with river segments, and have an adverse impact on management of these areas. These would all be exacerbated by the reasonably foreseeable actions and would contribute to the adverse effects the No Action Alternative has on VWSR designations.

4.4.11 WILDERNESS STUDY AREAS

Proposed Action

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire regimes, have resulted in an existing environment that is much different than the historical condition. Likewise, a variety of political and regulatory management directives associated with safety considerations and other resource needs affect how the role of fire and fuels management has been applied within these areas.

Reasonably foreseeable actions would lead to increases in recreational use, growth, and development, and implementation of the National Fire Plan. These actions would reduce opportunities for solitude and primitive recreation. As fire regimes are gradually re-established, naturalness would be enhanced.

No Action Alternative

Large-scale implementation of the National Fire Plan would increase naturalness in the long term, but the No Action Alternative would limit this increase on BLM-administered lands. Increased recreational use could reduce opportunities for solitude and primitive recreation.

4.4.12 LIVESTOCK GRAZING

Proposed Action

Additional regulatory direction related to the proposed revision to the grazing regulations on public lands would eventually lead to increased rangeland health and better management. Increased recreational use and continued spread of noxious weeds may have a negative impact on grazing resources. Changes in grazing regulations, combined with the effects of the Proposed Action would contribute to the long-term increased productivity and stability of grazing resources. The negative effects of noxious weed spread may be somewhat mitigated by the Proposed Action, as it would contribute to the overall improvement of health of grazing resources and make allotments more resistant to invasion of noxious weeds.

No Action Alternative

The effects of the No Action Alternative on livestock grazing include an increase in the vegetative fuel load, particularly in non-palatable species and would continue to increase the likelihood of severe wildland fires in the long term. Allotments would require longer recovery periods following fire. Regulations on grazing would eventually lead to increased rangeland health and better management. However, the increase in fuel loadings from the No Action Alternative would reduce stability of grazing resources. Negative impacts from the spread of noxious weeds on lands adjoining the Vernal planning area, combined with the added risk of severe wildfires from the No Action Alternative, would reduce the health and productivity of livestock grazing resources. This would be most pronounced in areas where cheatgrass infestation is of greatest concern.

4.4.13 WOODLANDS AND FORESTRY

Proposed Action

National Fire Plan activities, LUP and RMP revisions, implementation of Utah Rangeland Health and Guidelines for Grazing Management, and continuing implementation of the vegetation treatment on BLM lands in 13 Western states (BLM 1991) would all contribute to lowered FRCC, which would help protect old growth forests.

Increases in WUI, development, and recreational activities may eventually put more demands on local sources of biomass, timber, firewood, and pinyon nuts.

No Action Alternative

Cumulative effects under No Action Alternative would be similar to the Proposed Action, though fewer acres would trend toward a lower FRCC.

4.4.14 VEGETATION

Proposed Action

National Fire Plan activities, LUP and RMP revisions, implementation of Utah Rangeland Health and Guidelines for Grazing Management, and continuing implementation of the vegetation treatment on BLM lands in 13 Western states (BLM 1991) would all contribute to reductions in invasive species and fuel loads where treatments are applied.

Increases in WUI, development and recreational activities may eventually cause more acres to have wildfire suppression actions due to the AMR.

No Action Alternative

Cumulative effects of the No Action Alternative would be similar to the Proposed Action, except there would be fewer acres trending toward a lower FRCC.

4.4.15 FISH AND WILDLIFE

Proposed Action

Reasonably foreseeable actions would subject wildlife to temporary displacement and habitat alterations. Overall hazardous fuel reductions associated with the large scale implementation of the National Fire Plan on adjacent lands would gradually reduce the risk of a severe wildland fire event, and restore ecosystems that would reflect vegetation composition more consistent with natural fire regimes.

No Action Alternative

Overall hazardous fuel reductions associated with the implementation of the National Fire Plan on federal lands would gradually reduce the risk of a severe wildland fire event, and restore ecosystems that would reflect vegetation composition more consistent with natural fire regimes.

4.4.16 SOILS

Proposed Action

Effects of the Proposed Action (long-term reduction in soil loss, erosion, compaction and damage to the soil crust, and less risk of altered porosity and infiltration rates) would be added to the effects from reasonably foreseeable actions, such as increased recreational land use and noxious weeds. However, the Proposed Action would help to minimize the total negative effects. The implementation of management guidance for grazing, water quality (TMDLs), and OHV use and implementation of the National Fire Plan on a large scale would improve soil conditions when combined with the long-term effects of the Proposed Action.

No Action Alternative

Under the No Action Alternative, there would be an increasing risk over time of loss of vegetation cover and organic matter and an increase in erosion, along with a reduction in microorganisms and infiltration on BLM-administered lands, which would be minimally offset by implementation of the National Fire Plan by other agencies. Cumulative effects from reasonably foreseeable actions (described above) would exacerbate these problems with the exception of the improvements made when regulations decrease impacts. Overall, the cumulative long-term trend would be toward a more negative condition for soil on BLM lands.

4.4.17 RECREATION

Proposed Action

Recreation may be affected from reasonably foreseeable actions. Increased recreational use and facility development, ongoing growth and development, wildfire, increase in the WUI and noxious weeds would all change visitors' experiences.

Cumulatively, these effects may increase the susceptibility of recreational facilities, dispersed camping areas, trails, OHV routes and sanitation facilities to fire or fire suppression impacts. Long-term benefits include reduced fuel loadings leading to more effective protection against wildfire and improved safety of recreationists.

4.4.18 SOCIOECONOMICS

Proposed Action

A continued increase in WUI area, recreational use of BLM-administered lands, increased oil and gas extraction, and growth and development throughout the Vernal planning area, would put more pressure on the BLM to protect resources from wildland fire both inside and outside of WUI areas. An increase in public use would expose a greater number of people to impacts from fire management actions on, and adjacent to, BLM-administered lands. The effects of the Proposed Action and reasonably foreseeable development scenario could result in additional payroll for planned management actions and its corresponding increase in agency expenses.

Reasonably foreseeable actions, together with the Proposed Action, could cause a loss of forest harvesting opportunities and create a minor decrease in the income of local residents or require them to travel farther to gather those products. Impacts on livestock grazing permittee incomes through loss of forage would increase with the increase in other land uses, such as oil and gas development, in combination with impacts from wildland fire.

No Action Alternative

A continued increase in WUI area, recreational use of BLM-administered lands, oil and gas development, and growth and development throughout the Vernal planning area in combination with the trend toward more and larger severe wildland fires would increase the economic impact to forest product harvesters and livestock grazing permittees. These impacts would come through a loss in the quantity of forest products harvesting opportunities due to a decrease in forested areas and a decrease in the acreage of forage available to livestock.

4.4.19 WILD HORSES AND BURROS

Proposed Action

Increased OHV use and oil and gas development would put more pressure on HMAs and the HA in the future by increasing human presence and decreasing forage availability. The Proposed Action's long-term trend of smaller and more natural wildland fire, as well as ongoing management of activities such as noxious weed control would help offset impacts from OHV and oil and gas development.

No Action Alternative

Continued increases in OHV use and oil and gas development in combination with larger severe wildland fires would infringe on HMAs and the HA. More loss of forage and longer recovery periods would be expected. Herds may be displaced by the cumulative influence of less forage and more human presence.

4.4.20 WILDERNESS CHARACTERISTICS

Proposed Action

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire regimes, have resulted in an existing environment that is much different than the historical condition. Likewise, a variety of political and regulatory management directives associated with safety considerations and other resource needs affect how the role of fire and fuels management has been applied within these areas.

Reasonably foreseeable actions would lead to increases in recreational use, growth and development, and implementation of the National Fire Plan, thereby reducing opportunities for solitude and primitive recreation. As fire regimes are gradually re-established, naturalness would be enhanced.

No Action Alternative

Large-scale implementation of the National Fire Plan would increase naturalness in the long term, but the No Action Alternative would limit this increase on BLM-administered lands. Increased recreational use could reduce opportunities for solitude and primitive recreation.

CHAPTER 5. CONSULTATION AND COORDINATION

5.1 INTRODUCTION

Issues identified for analysis within this EA are included in **Appendix A**, which contains the resource concerns identified, including those resources considered as Critical Elements of the Human Environment and related issues derived from the BLM, affiliated agency reviews, and comments received.

A thorough consultation and coordination effort among agencies and public parties with interests in the process was planned and conducted to ensure the opportunity for involvement throughout the EA process. Among the interested parties were federal, state and local government agencies, and tribes that create, administer, and monitor policy for these lands and adjacent lands. BLM established a coordinated collaborative effort in developing the EA by seeking the active participation from all of these parties.

5.2 PERSONS, GROUPS, AND AGENCIES CONSULTED

The BLM coordinated and collaborated with numerous federal, state, tribal, and local government agency representatives as well as private organizations and individuals wishing to participate in the LUP amendment and FMP revision processes. The BLM contacted more than 60 federal representatives; 40 Utah state agency representatives (several in the neighboring states of Arizona, Nevada, and Colorado); 100 county and city governments across Utah; and more than 70 tribes and tribal representatives. Each contact received public scoping meeting notices and planning bulletins informing them of the purpose, schedule, and progress of the project. The mailing list, containing all agency points of contact, is contained in the Administrative Record within the project documentation. **Table 5.1** lists persons, agencies, and organizations consulted for purposes of the FMP EA.

TABLE 5.1: LIST OF PERSONS, AGENCIES, AND ORGANIZATIONS CONSULTED

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
U.S. Environmental Protection Agency (EPA), Region 8	Consultation for responsibilities under National Environmental Policy Act (NEPA) and Section 309 of the Clean Water Act	The EPA provided formal comments to the BLM during public scoping on May 17, 2004 and identified concerns that included the need to develop broad fire planning to protect local ecology, recreation, and commodity production. The EPA requested that BLM consider management needs for local fuel hazards; that fire management planning would conform to interim air quality policy and local smoke management plans; and that management be developed to protect aquatic resources from adverse impacts on soil and water. The EPA also identified analysis considerations associated with livestock grazing and noxious weed control. The BLM considered EPA's comments and incorporated them into the Proposed Action and the analysis of the alternatives.
U.S. Fish and Wildlife Service (USFWS)	Consultation under Section 7 of the Endangered Species Act (ESA) (16 USC 1531) and Biological Assessment (BA) Review	USFWS is a participating party who is consulting under an agreement that tiers off the BLM and USFWS November 1, 2001 consultation agreement and March 3, 2004 alternative consultation agreement for land use planning. The service has provided comment and analysis recommendations for the species list prepared by the BLM. The

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
		service has also reviewed, provided additional RPMs, and concurred with the species findings within the BA, completed on March 4, 2005. The Biological Opinion was completed in September, 2005.
Tribes and Tribal Representatives within Utah and Surrounding States	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and National Historic Preservation Act (NHPA) (16 USC 1531)	Planning bulletins were provided to approximately 50 tribes by BLM on June 21, 2004. In addition, individual letters were sent to each tribal government on June 29, 2004 regarding BLM's intent to conduct this EA and requesting their participation and cooperation. Tribes were also invited to public scoping meetings that took place from July 6-14, 2004. To date, no tribal government has agreed to participate or formally consult on this project.
Utah Governor's Office of Planning and Budget—Resource Development Coordinating Committee (RDCC)	Consultation regarding on-going multi-agency planning actions and associated federal planning actions	BLM and Maxim Technologies (Maxim) met with the RDCC on June 23, 2004 to discuss the scope of proposed fire management planning and to seek input from associated state agencies that may be affected by the proposed federal actions. Utah Division of Wildlife Resources (UDWR) and Utah Division of Forestry, Fire, and State Lands (FFSL) indicated their desire to be involved in federal fire planning discussions (see proceeding comments). RDCC also responded to the BLM with a formal letter on July 15, 2004, which outlined the UDWR's considerations.
Utah Department of Community and Economic Development—Utah State Historic Preservation Office (SHPO)	Consultation on proposed fire management as required by the NHPA (16 USC 470)	BLM and Maxim staff met with SHPO (in June 2004 and July 2004) to discuss scope of planning and the possibility of SHPO acting as a participating party in the FMP process. SHPO had determined at these meetings not to act as a participating party, but they did provide feedback on the scope and analysis of the Proposed Action. In a meeting on January 25, 2005, BLM and SHPO agreed to develop a programmatic agreement specifically addressing wildland fire use on public lands within Utah.
Utah Division of Natural Resources—Division of Forestry, Fire and State Lands (FFSL)	Consultation on fire management planning on adjacent state lands	FFSL attended the BLM statewide interdisciplinary team (IDT) meeting on June 22, 2004 and June 23, 2004, and contributed to scope and analysis discussions. BLM met with FFSL on August 24, 2004 to discuss the proposed direction of statewide fire management on public lands, as well as the need to coordinate with local BLM field offices in the development of fire management planning at a local level as identified in the FMPs that tier off the statewide land use plan (LUP) amendment. Maxim staff coordinated with FFSL staff in September and October 2004 to obtain resource data and historic wildland fire information to support BLM data and the development of the environmental assessments (EAs).

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
Utah Division of Natural Resources—Division of Wildlife Resources (UDWR)	Consultation on impacts of fire management on fish and wildlife species	UDWR, in association with the Governor’s Office of Planning and Budget, and RDCC, provided formal comments to the BLM on July 15, 2004, and a request to be included as a participating party. The BLM coordinated proposed fire management actions and considerations of wildland fire use to benefit wildlife habitat with UDWR. Maxim staff coordinated with a variety of UDWR personnel, from July through October 2004, in developing fish and wildlife resource data, GIS data, and scope of analysis within the EA. These meetings also included coordination with the UDWR Utah Natural Heritage Program.
Uintah County Commission	Informal discussion with county commissioner on resource issues in county	On July 13, 2004, the Uintah County Commissioner provided comments to BLM in regard to protection of sage grouse habitat and limited restriction on livestock grazing of burned areas. Comments in regard to habitat were incorporated into the Proposed Action for the statewide amendment EA and Vernal FMP EA. Limited restriction on livestock allotment resting was considered during development of the LUP and FMP Proposed Actions.

5.3 SUMMARY OF PUBLIC PARTICIPATION

During preparation of the FMP EA, the public was notified of the Proposed Action. A Notice of Intent (NOI) invited participation of interested agencies, organizations, and members of the general public to assist the BLM in determining the scope of issues to be addressed. It was published in the Federal Register on April 2, 2004. The publication of this NOI initiated a public scoping comment period that ended on July 21, 2004.

A Public Involvement Plan was prepared in June 2004 to ensure an effective, consistent, and open communication process among BLM and other federal, state, and local government agencies; Native American tribes; the public; and other stakeholders. This plan not only outlined the series of open house public meetings throughout the state that would allow for comment and discussion on current and proposed fire management, but also planned for continued public involvement opportunities throughout the project.

A Planning Bulletin was also developed to advise the public of fire management project. It also described the project, encouraged public participation at the public scoping meetings, and identified opportunities and methods for submitting comments throughout the NEPA process. In addition to providing background information, the Bulletin outlined the public involvement process for the project; the schedule; a listing of public meetings; instructions on making comments and joining the mailing list, information about the project’s public website; and contact information. On June 24, 2004, the Bulletin was sent to 1,149 individuals, organizations, state, county and city government agencies, and tribal governments and groups on the BLM’s mailing list. The BLM sent each tribal government an individualized letter (dated June 29, 2004) inviting them to consult on the project. Native American consultation is ongoing. All entities on the mailing list were contacted about the project and invited to submit comments. In addition, a website has been established that displays information about this project. It is located at <http://www.ut.blm.gov/fireplanning/index.htm>.

5.3.1 PUBLIC MEETINGS

On June 25, 2004, a public notice was delivered as a media advisory and press release to Utah newspapers, radio stations, and one cable television station. It also went to newspapers and radio stations in Arizona, Colorado, and Nevada. The notice announced public scoping meeting dates, times, and locations, and invited the public to participate. Prior to the formal scoping process, the BLM provided a number of opportunities for federal, state, and local agencies, interested organizations, and the general public to provide input for the planning process. These opportunities included early notification of the scoping process, a lengthy comment period, a variety of venues for meetings, and newspaper reminders of meeting times and locations. Comments were received from April 2, 2004 through July 21, 2004.

From July 6, 2004 through July 14, 2004, BLM conducted five open house meetings in Moab, Cedar City, Richfield, Vernal, and Salt Lake City, Utah. These meetings were announced in a Planning Bulletin that was mailed on June 24, 2004, to more than 1,100 individuals and organizations throughout the state. News releases were issued to state and local media that communicated the purpose of the meetings, as well as the time and place of each meeting. Further, the Utah BLM webpage advertised the meetings and scoping period. Approximately 700 subscribers of the Utah BLM electronic newsletter ("E-Briefs") received related information. News releases were issued to state and local media that communicated the purpose of the meetings, as well as the time and place of each meeting. A series of Public Scoping Meetings were held across the state according to the schedule in **Table 5.2**.

TABLE 5.2: PUBLIC SCOPING MEETINGS

Date	City	Facility	Address
July 6, 2004	Moab	BLM Field Office	82 East Dogwood
July 7, 2004	Cedar City	Heritage Center, Festival Hall I	90 North Main
July 8, 2004	Richfield	BLM Field Office	150 East 900 North
July 13, 2004	Vernal	Western Park	302 West 200 South
July 14, 2004	Salt Lake City	BLM Field Office	2370 South 2300 West

5.3.2 PUBLIC COMMENTS

Responses to solicitations for public input resulted in letters that were received via fax, mail, email, and hand. There were 91 comments identified from 20 letters received during the scoping process. A comment summary table is found in the Scoping Report. The letters received can be found in the Administrative Record.

5.4 LIST OF PREPARERS

BLM selected an environmental consultant, Maxim Technologies, from a list of qualified environmental services contractors through a competitive procurement process to support Utah BLM on this important FMP EA. Therefore, the preparers of this EA included a combination of BLM and contract personnel.

5.4.1 BLM PREPARERS

BLM participants and their responsibilities are listed in **Table 5.3**. BLM also assigned a contracting officer's representative and technical project lead with primary responsibilities for oversight of contractors, agency collaboration, and NEPA process.

TABLE 5.3: BLM INTERDISCIPLINARY TEAM

Name	Title	Document Section Responsibility
Jolie Pollet	Project Manager	Technical coordination, quality control, vegetation, fire ecology, Proposed Action, resource protection measures
Matthew Higdon	National Environmental Policy Act Planner	Technical coordination, quality control, planning
Tim Faircloth	Threatened and Endangered Species (TES) Specialist	Section 7 consultation, review of wildlife, TES
Michael Dussinger	Cultural Resource Specialist	Cultural resources, Native American consultation
Steven Strong	Natural Resource Specialist	Soils, forestry, fuels/fire management
Tim Faircloth	Wildlife Biologist	Wildlife, fisheries
Marc Stavropoulos	Range Specialist	Livestock grazing
Kim Bartel	Recreation Specialist	Recreation, special designation, wilderness, visual
Robert Specht	Botanist	Vegetation, special status plants/invasive weeds
Del Clark	Range Technician	Wildhorses
Karl Wright	Natural Resource Specialist	Watersheds, floodplains/riparian

5.4.2 MAXIM TECHNOLOGIES PREPARERS

The Maxim Technologies IDT is listed in **Table 5.4**.

TABLE 5.4: MAXIM TECHNOLOGIES INTERDISCIPLINARY TEAM

Name	Title	Document Section Responsibility
Jim Melton	Project Manager	Planning, National Environmental Policy Act (NEPA)
David Steed	Asst. Project Manager	U.S. Fish and Wildlife Service consultation, planning, NEPA
Mike Egan	Asst. Project Manager	Planning, cultural resources, grazing
Susan Hatch	Biologist	Special status species, fish and wildlife, areas of critical environmental concern (ACECs), wilderness characteristics, socioeconomics, wilderness study areas, riparian and wetlands
Terry Grotbo	Senior NEPA and Planning Advisor	NEPA review
Fred Gifford	GIS Coordinator	GIS, database
Cameo Flood	Forester	Vegetation, woodlands and forests, chapters 3 and 4
Valerie Waldorf	Lead GIS Specialist	GIS, maps, figures, socioeconomics, wild horses and burros

Name	Title	Document Section Responsibility
Wynn John	Environmental Engineer	Soil, water, floodplains
Tennille Flint	Biologist	ACECs, wilderness characteristics, socioeconomics, wilderness study areas, riparian and wetlands, chapter I
Nancy Linscott	Socioeconomics Specialist	Socioeconomics, environmental justice
Dale-Marie Herring	Technical Writer/Coordinator	Writing, editing, chapters 1, 2, 3, 5, coordination

CHAPTER 6. ACRONYMS, GLOSSARY, AND REFERENCES

6.1 ACRONYMS

ACEC	Area of Critical Environmental Concern	IDT	Interdisciplinary Team
AMR	Appropriate Management Response	LUP	Land Use Plan
BLM	Bureau of Land Management	NEPA	National Environmental Policy Act
CEQ	Council on Environmental Quality	NHPA	National Historic Preservation Act
CWA	Clean Water Act	OHV	Off-highway Vehicle
DWFC	Desired Wildland Fire Condition	PFC	Properly Functioning Condition
EA	Environmental Assessment	PLO	Public Land Order
EIS	Environmental Impact Statement	RPM	Resource Protection Measure
EO	Executive Order	RMP	Resource Management Plan
EPA	Environmental Protection Agency	ROI	Region of Influence
ESA	Endangered Species Act	SSS	Special Status Species
ESR	Emergency Stabilization and Rehabilitation	TCP	Traditional Cultural Property
FLPMA	Federal Land Policy and Management Act	TMDL	Total Maximum Daily Load
FMP	Fire Management Plan	UDEQ	Utah Department of Environmental Quality
FMU	Fire Management Unit	UDWR	Utah Division of Wildlife Resources
FRCC	Fire Regime Condition Class	USFWS	U.S. Fish and Wildlife Service
GAP	Gap Analysis Program	WSA	Wilderness Study Area
HA	Herd Area	WUI	Wildland Urban Influence
HMA	Herd Management Area		

6.2 GLOSSARY

Agency	Any federal, state, or county government organization participating with jurisdictional responsibilities.
Air Quality	The characteristics of the ambient air (all locations accessible to the general public) as indicated by concentrations of the six air pollutants for which national standards have been established (e.g., particulate matter, sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, and lead), and by visibility in mandatory federal Class I areas. For the purposes of the Utah Smoke Management Plan, concentrations of particulate matter are taken as the primary indicators of ambient air quality.
Alternative	One of at least two proposed means of accomplishing planning objectives.
Analysis	The examination of existing and/or recommended management needs and their relationships to discover and display the outputs, benefits, effects, and consequences of initiating a proposed action.
Appropriate Management Response (AMR)	Specific actions taken in response to a wildland fire to implement protection and fire use objectives. Responses range from full suppression to managing fire for resource benefits (fire use).
Area of Critical Environmental Concern (ACEC)	An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and provide safety from natural hazards.
Aspect	Direction toward which a slope faces.
Assessment	The act of evaluating and interpreting data and information for a defined purpose.
Biological Treatment	Biological treatment of vegetation could typically employ grazing by cattle, sheep, or goats, but as technology progresses, it may also include insects, but would not include the use of invertebrates or microorganisms.
Biomass	The dry weight of plants in a unit area.
Brush	A collective term that refers to stands of vegetation dominated by shrublands, shrubby woody plants, or low-growing trees.
Buffer Zones	An area of reduced vegetation that separates wildland from vulnerable residential or business developments or other high-value areas. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.
Chemical Treatment	The use of herbicide to control herbaceous and woody species. BLM would use EPA-approved herbicides in accordance with EPA's Endangered Species Pesticide Program covered in BLM's <i>Vegetation Treatment on BLM Lands in Thirteen Western States FEIS</i> (May 1991).

Clean Air Act	A federal law enacted to insure that air quality standards are attained and maintained. Initially passed by Congress in 1963, it has been amended several times, the latest being August of 1977.
Climax	A terminal stage of ecological succession in which the vegetation association remains stable over a relatively long period.
Closure	Legal restriction – but not necessarily elimination – of specified activities such as smoking, camping, or entry that might cause fires in a given area.
Collaboration	A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support, for managing public and other lands.
Composition	The numbers and kinds of plants and animals in an area.
Condition Class	Condition class (CC) is a classification of the amount of departure from the natural condition. The three classes are based on low (CC 1), moderate (CC 2), and high (CC 3) departure from the central tendency of the natural (historical) regime. See: www.frcc.gov .
Critical Habitat	Federally-mandated (under the ESA of 1973, as amended) designation for threatened or endangered species that is proposed, designated, and managed by the U.S. Fish and Wildlife Service.
Critical Seasonal Use Area	Designation provided by the Utah Division of Wildlife Resources for the most important / valuable big game seasonal use areas in the state that they manage.
Cultural Resources	Those resources of historical, archaeological, or paleontological significance. Non-renewable elements of the physical and human environment including archaeological remains (evidence of prehistoric or historic human activities) and sociocultural values traditionally held by ethnic groups (sacred places, traditionally used raw materials, etc.).
Cumulative Effects	Cumulative effects result from the impacts of past, present, and reasonably foreseeable future activities combined with the projected direct and indirect effects of each alternative considered.
Direct Effects	Direct effects are those consequences that are expected to occur following implementation of an alternative. Direct effects are caused by the action and occur at the same time and place as the action.
Disturbance	Any relatively discrete event, either natural or human-induced that causes a change in the existing condition of an ecological system.
Ecosystem	An arrangement of organisms defined by the interactions and processes that occur between them. Ecosystems are often defined by their composition, function, and structure.

Ecosystem Sustainability	The ability to sustain diversity, productivity, resilience to stress, health, renewability, and/or yields of desired values, resource uses, products, or services from an ecosystem while maintaining the integrity of the ecosystem over time.
Emergency Stabilization and Rehabilitation (ESR)	Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources after unplanned wildfires.
Endangered Species	Any animal or plant species in danger of extinction in a portion of its range. This is a federal designation (under the ESA of 1973 as amended). Most of these species fall under the jurisdiction of the U.S. Fish and Wildlife Service.
Endemic	A species restricted to a given geographical location and native to that locale.
Environment	All that surrounds an organism and interacts with it.
Environmental Assessment (EA)	EAs were authorized by NEPA of 1969. They are concise, analytical documents prepared with public participation that determine whether an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.
Environmental Impact Statement (EIS)	EISs were authorized by NEPA of 1969. Prepared with public participation, they assist decision makers by providing information, analysis, and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.
Environmental Justice	The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.
Ephemeral	A stream that flows only in direct response to precipitation, and whose channel is above the water table at all times.
Fine (Light) Fuels	Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which is less than 1/4-inch in diameter and has a time lag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.
Fire Intensity	A general term relating to the heat energy released by a fire.
Fire Management Plan (FMP)	A FMP is a functional activity plan for the fire management program. The FMP is the primary tool for translating programmatic direction developed in the land management plan into on-the-ground action. The FMP synthesizes broad fire management goals and places them into a strategic context. Criteria for making initial action decisions must be a component of the FMP.

Fire Management Unit (FMU)	Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that set it apart from management characteristics of an adjacent unit. FMUs are delineated in FMPs. These units have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.
Fire Regime	<p>The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity fires to long-interval, high-intensity fires. The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:</p> <p>I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced).</p> <p>II – 0-35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).</p> <p>III – 35-100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced).</p> <p>IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).</p> <p>V – 200+ year frequency and high (stand replacement) severity. (See www.frcc.gov).</p>
Fire Return Interval	The number of years between two successive fires in a designated area.
Fire Season	<p>1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities.</p> <p>2) A legally enacted time during which burning activities are regulated by state or local authority.</p>
Fire Severity	Fire severity is a product of fire intensity and residence time at a site. Severity denotes the effects, from low to high, of fire on the soil and vegetation components of a site.
Fire Use	The combination of wildland fire use and prescribed fire application to meet resource objectives.
Fireline	A linear fire barrier that is cleared of fuels and scraped or dug to mineral soil. Also called control line, containment line or line.
Forage	Vegetation of all forms available and of a type used for animal consumption.
Forbs	Plants with soft, rather than permanent, woody stems that are not grass or grass-like plants.
Forest Products	Woodland and timber products, such as posts, poles, firewood, Christmas trees, and sawlogs.

Fuel	A combustible material, including vegetation such as grass, leaves, ground litter, plants, shrubs, and trees that feed a fire. (See Surface Fuels.)
Fuel Reduction	Manipulation, including combustion and/or or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.
Fuels Management	The practice of evaluating, planning, and executing the treatment of wildland fuel to control flammability and reduce the resistance to control through mechanical, chemical, biological, or manual means, or by prescribed and wildland fire, in support of land management objectives.
Fuel Type	An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.
Geographic Area	A political boundary designated by the wildland fire protection agencies, where these agencies work together in the coordination and effective utilization of resources. See www.fs.fed.us/fire/reports.shtml for a listing of and links to Geographic Area Coordination Centers.
Goal	A concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms (usually not quantifiable) and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principle basis from which objectives are developed.
Grazing Permit	An authorization that allows grazing on public lands. Permits specify class of livestock on a designated area during specified seasons each year. Permits are of two types: preference (10 year) and temporary non-renewable (1 year).
Guideline	Actions or management practices that may be used to achieve desired outcomes, sometimes expressed in Best Management Practices (BMPs). Guidelines may be identified during the land use planning process, but they are not considered a land use decision unless the plan specifies that they are mandatory. Guidelines for grazing administration must conform to 43 CFR 4180.2
Habitat	A specific set of physical conditions in geographical area(s) that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.
Implementation Plan	A sub-geographic or site-specific plan written to implement decisions made in a LUP. Implementation plans include both activity plans and project plans.
Incident	A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources. Incident management teams also handle other non-fire emergency response, including tornadoes, floods, hurricanes, earthquakes, and other disasters or large events.

Indirect Effects	Indirect effects are those consequences, which are expected to occur following implementation of an alternative. Indirect effects are caused by the action and occur later in time or farther from the activity.
Interdisciplinary Team (IDT)	A team representing several disciplines to ensure coordinated planning of the various resources.
Ladder Fuels	Fuels that provide vertical continuity between strata and allow fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.
Land Use Plan (LUP)	A set of decisions that establish management direction for land within an administrative area. An assimilation of land-use-plan-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes both RMPs and MFPs.
Landscape	An area of interacting and interconnected patterns of habitats (ecosystems) that are repeated because of the geology, land form, soil, climate, biota, and human influences throughout the area. Landscape structure is formed by disturbance events, successional development of landscape structure, and flows of energy and nutrients through the structure of the landscape. A landscape is composed of watersheds and smaller ecosystems. It is the building block of biotic provinces and regions.
Large Fire	1) For statistical purposes, a fire burning more than 100 acres. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.
Light (Fine) Fuels	Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which is less than 1/4-inch in diameter and has a time lag of one hour or less. These fuels ignite readily and are rapidly consumed by fire when dry.
Litter	Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.
Long Term	Defined in this document as 10 years or more. This applies to any long-term use.
Management Concern	An issue, problem, or condition that constrains the range of management practices identified by the Forest Service in the planning process.
Management Direction	A statement of multiple-use and other goals and objectives, associated management prescriptions, and standards and guidelines for attaining them.
Management Framework Plan (MFP)	A LUP for public lands administered by BLM that provides a set of goals, objectives, and constraints for a specific planning unit or area; a guide to the development of detailed plans for the management of each resource. This form of plan is now being replaced with RMPs.
Management Practice	A specific activity, measure, course of action, or treatment.

Mechanical Treatment	Mechanical treatments of vegetation employ several different types of equipment to suppress, inhibit, or control herbaceous and woody vegetation. For the purposes of this plan, mechanical treatments may include employing the following: cabling, chaining, disking (or disk plowing), bulldozing, mowing, beating, crushing, chopping or shredding vegetation using a variety of mechanized equipment.
Monitoring (Plan Monitoring)	The process of tracking the implementation of LUP decisions and collecting and assessing data and/or information necessary to evaluate the effectiveness of land use planning decisions.
National Ambient Air Quality Standards	Standards for maximum acceptable concentrations of pollutants in the ambient air to protect public health with an adequate margin of safety, and to protect public welfare from any known or anticipated adverse effects of such pollutants (e.g., visibility impairment, soiling, materials damage, etc.) in the ambient air.
National Environmental Policy Act (NEPA)	NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes EISs and EAs to be used as analytical tools to help federal managers make decisions on management of federal lands.
Naturalness	An area which “generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable” (Section 2[c], <i>Wilderness Act</i>).
Non-fire Fuel Treatments	Includes manual, mechanical, biological, chemical, and seeding actions.
Objective	A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.
Off-road Vehicle (ORV)	Any motorized vehicle designated for or capable of cross-country travel over lands, water, sand, snow, ice, marsh, swampland, or other terrain excluding: (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle used in national defense.
Old Growth	A wooded area, usually greater than 200 years of age, which has never been altered or harvested by humans. An old-growth forest often has large individual trees, a multi-layered crown canopy, and a significant accumulation of coarse woody debris including snags and fallen logs. Utah BLM would adopt the U.S. Forest Service (USFS) old-growth definitions and identification standards per the USFS document <i>Characteristics of old-growth forests in the intermountain region</i> (April 1993). In instances where the area of application in the previous document doesn’t apply to specific species (e.g., <i>Pinus edulis</i>), use the document <i>Recommended old-growth definitions and descriptions, UDSA Forest Service southwestern region</i> (Sept. 1992).

Perennial	A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.
Planning Area	One or more planning units for which MFPs were prepared under previous BLM planning procedures.
Planning Unit	As used in previous BLM planning, a geographical unit within a BLM district. It included related lands, resources, and use pressure problems that were considered together for resource inventory and planning.
Prescribed Fire	Any fire ignited by management actions under certain predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written prescribed fire plan must exist, and NEPA requirements must be met prior to ignition.
Prescription	Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of AMRs, and indicate other required actions. Prescription criteria may include a combination of safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.
Prevention	Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.
Public Lands	Any lands or interest in lands outside of Alaska owned by the United States and administered by the Secretary of the Interior through the BLM, except located on the Outer Continental Shelf and lands held for the benefit of Indians.
Public Participation	The process of attaining citizen input into each planning document development stage. It is required as a major input into the BLM's planning system.
Range Improvements (Structural / Nonstructural)	Any activity or program on or relating to rangelands designed to improve forage production, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, and enhance habitat for livestock, wildlife, and wild horses and burros. Rangeland improvements include non-structural land treatments (such as chaining, seeding, and burning), and structural (such as stockwater developments, fences, and trails).
Rangeland	Land dominated by vegetation that is useful for grazing and browsing by animals. Range and rangeland are used interchangeably.
Raptors	Birds of prey, such as the eagle, falcon, hawk, owl, or vulture.
Recreation Opportunities	Favorable circumstances enabling visitors' engagement in a leisure activity to realize immediate psychological experiences and attain more lasting, value-added beneficial outcomes.
Region	May be any geographical area larger than a planning area (socioeconomic profile area, sub-state, state, multi-state, or national), appropriate for comparative area analysis and for which information is available. Regions may be different for different resources or subject matter analysis.

Rehabilitation	The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.
Resource Area	A geographic portion of a BLM district. An administrative subdivision whose manager has primary responsibility for day-to-day resource management activities and resource use allocations. In most instances it is the area for which RMPs are prepared and maintained.
Resource Management Plan (RMP)	A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.
Resources	1) Personnel, equipment, services, and supplies available or potentially available for assignment to incidents. 2) The natural resources of an area, such as timber, grass, watershed values, recreation values, and wildlife habitat.
Retardant	A substance or chemical agent that reduces the flammability of combustibles.
Riparian Habitat	A native environment growing near streams, reservoirs, ponds, etc. that provides food, cover, water, and living space (permanent or intermittent). It is usually unique or limited in arid regions and is, therefore, of great importance to a wide variety of wildlife.
Seeding (and Planting)	Involves the introduction of seeds and plants to a site that alters existing plant communities and influences successional processes.
Sensitive Species	Species not yet officially listed but that are undergoing status review for listing on the U.S. Fish and Wildlife Service official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.
Severity	Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time (duration) of the fire. Severity denotes the effects, from low to high, of fire on the soil and vegetation components of a site.
Short Term	Defined in this document as one to five years. This applies to any short-term use.
Slash	Debris left after logging, pruning, thinning, or brush cutting. Includes logs, chips, bark, branches, stumps, and broken understory trees or brush.
Smoke Management	Conducting a prescribed fire under fuel moisture and meteorological conditions, and with firing techniques that keep the smoke's impact on the environment within acceptable limits.
Soil Compaction	Increasing the soil bulk density, and concomitantly decreasing the soil porosity, by the application of mechanical forces to the soil.

Soil Disturbance	Physical disturbance of the vegetation or soil surface by any action, usually via mechanical or manual tools. Includes all activities except casual use, wildland fire, and prescribed fire treatments. See Surface Disturbance.
Special Recreation Management Areas	Recreation management areas that receive emphasis and priority in BLM's recreation planning and management efforts. The recreation resources in these areas require explicit management to provide specified recreation setting, activity, and experience opportunities. Recreation management objectives would provide explicit guidelines with respect to the existing opportunities and problems in these areas. RMPs would subsequently be prepared for special recreation management areas using RMP objectives for guidance.
Special Status Species (SSS)	Includes proposed species, listed species, and candidate species under the ESA; state-listed species; and BLM state director-designated sensitive species (see BLM Manual 6840, Special Status Species Policy).
Standard	Forest plan standards describe a condition of land, normally a maximum or minimum condition, which is measurable. A standard can also be expressed as a constraint on management activities or practices. Deviation from compliance with a standard requires a forest plan amendment.
State Lands	Lands controlled or administered by the State of Utah.
Strategy	The science and art of command as applied to the overall planning and conduct of an incident.
Structure	The sizes, shapes, and/or ages of the plants and animals in an area.
Succession	Observed process of change in the species structure (and composition) of an ecological community over time.
Suppression	A management action intended to extinguish a fire or alter its direction of spread.
Surface Disturbance	Any surface disturbing activity (does not include fire).Disturbance of the vegetative or soil surface by any action. Includes all activities but casual use and wildland fire or fire treatments. See Soil Disturbance.
Surface Fuels	Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.
Sustainability	The ability to maintain a desired condition or flow of benefits over time.
Tactics	Deploying and directing resources on an incident to accomplish the objectives designated by strategy.
Total Maximum Daily Load (TMDL)	An estimate of the total quantity of pollutants (from all sources: point, nonpoint, and natural) that may be allowed into waters without exceeding applicable water quality criteria.

Values at Risk	To rate according to a relative estimate of worth when exposed to a chance of loss or damage.
Vegetation Treatment	Changing the characteristics of an established vegetation type to improve rangeland forage or wildlife habitat resources. Treatments are designed for specific areas and differ according to the area's suitability and potential. The most common land treatment methods alter the vegetation by chaining, spraying with herbicides, burning, and plowing, followed by seeding with well adapted desirable plant species.
Vegetation	Plants in general or the sum total of the plant life above and below ground in an area.
Visibility	The greatest distance in a given direction where it is possible to see and identify with the unaided eye a prominent dark object against the sky at the horizon.
Wetlands	Lands including swamps, marshes, bogs, and similar areas, such as wet meadows. They also include River overflows, mud flats, and natural ponds.
Wilderness Area	An area officially designated as wilderness by Congress. Wilderness areas will be managed to preserve wilderness characteristics and shall be devoted to the public purposes of recreation, scenic, scientific, educational, conservation, and historical use.
Wilderness Study Area (WSA)	Areas under study for possible inclusion as a wilderness area in the National Wilderness Preservation System.
Wilderness	An area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitations.
Wildfire	A free-burning fire requiring a suppression response.
Wildland	Any area under fire management jurisdiction of a land management agency.
Wildland Fire Situation Analysis (WFSA)	A decision making process that evaluates alternative management strategies against selected criteria (e.g., safety, environmental, social, political, economic), and resource management objectives.
Wildland Fire Suppression	An AMR to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire. All wildland fire suppression activities provide for firefighter and public safety as the highest consideration, but minimize loss of resource values, economic expenditures, and/or the use of critical firefighting resources.
Wildland Fire	Any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Use (WFI)	The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in an FMP. Operational management is described in the WFIP. Wildland fire use is not to be confused with “fire use,” a broader term encompassing more than just wildland fires.
Wildland Urban Interface (WUI)	The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Because of their location these structures are extremely vulnerable to fire should an ignition occur in the surrounding area.
Woodlands	Forest lands stocked with other than timber species (i.e., pinyon and juniper woodland, mountain mahogany, etc.). A plant community in which, in contrast to a typical forest, the trees are often small and relatively short compared to their crown (i.e., pinyon and juniper). Uses of the woodland products are generally limited to firewood, posts, and harvest of fruit (pinyon nuts).

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Appendix A
Interdisciplinary Team Analysis Record Checklist

INTERDISCIPLINARY TEAM ANALYSIS RECORD CHECKLIST

Project Title: VERNAL Management Plan Environmental Assessment

NEPA Log Number: VFO UT-080-2004-0430

File/Serial Number:

Project Leader: Troy Suwyn, Steve Strong

FOR EAs/CXs: NP: not present; NI: resource/use present but not impacted; PI: potentially impacted

STAFF REVIEW OF PROPOSAL:

NP/NI/ PI NC	Resource	Date Reviewed	Signature	Review Comments (required for all NIs and PIs. PIs require further analysis.)
CRITICAL ELEMENTS				
NI	Air Quality	10.26.2004	Steve Strong	Planned ignitions follow Utah Smoke Management Plan (SMP). Unplanned ignitions not subject to Utah SMP
PI	Areas of Critical Environmental Concern (ACEC)	10.26.2004	Kim Bartel	Impacts on the values the ACECs were designated to address, as important and relevant.
PI	Cultural Resources	10.26.2004	Michael Dussinger	Impacts on cultural sites.
NI	Environmental Justice	10.26.04	Jean Nitschke-Sinclear	According to the EPA Region 8, 1999, State of Utah, Environmental Justice Map, the region has been categorized as a minority population area of 10 to 20 percent and a poverty population area of 10 to 20 percent. No minority or economically disadvantaged communities or populations are present that would be affected by the Proposed Action or No Action Alternative. (http://www.epa.gov/enviro/ej , 8/9/04)
NP	Farmlands (Prime or Unique)	10.26.04	Jean Nitschke-Sinclear	These are uniquely identified areas and there are none in the Vernal field office.

NP/NI/ PI NC	Resource	Date Reviewed	Signature	Review Comments (required for all NIs and PIs. PIs require further analysis.)
PI	Floodplains	10.26.2004	Karl Wright	Impacts on natural and beneficial use of floodplains
PI	Invasive, Non-native Species	10.26.2004	Robert Specht	Potential for increased noxious weed infestation from unplanned fire.
PI	Native American Religious Concerns	10.26.2004	Michael Dussinger	Impacts of fire on traditional cultural properties, and areas of traditional cultural importance.
PI	Threatened, Endangered or Candidate Species - Plants	10.26.2004	Robert Specht	Impacts on listed / candidate plant species from suppression.
PI	Threatened, Endangered or Candidate Species – Animals	10.26.2004	Tim Faircloth	Impacts on listed / candidate animal species from unplanned actions.
NI	Wastes (hazardous or solid)	10.26.2004	Merlin Sinfield	No chemicals subject to SARA Title III in amounts greater than 10,000 pounds would be used. No extremely hazardous substances as defined in 40 CFR 355 in threshold planning quantities would be used.
PI	Water Quality (drinking/ground)	10.26.2004	Karl Wright	Impacts on water quality.

NP/NI/ PI NC	Resource	Date Reviewed	Signature	Review Comments (required for all NIs and PIs. PIs require further analysis.)
PI	Wetlands/Riparian Zones	10.26.2004	Karl Wright	Impact to riparian from suppression and fuels management.
PI	Wild and Scenic Rivers	10.26.2004	Kim Bartel	Impacts on outstanding remarkable values, tentative classification.
NP/PI	Wilderness / Wilderness Study Areas (WSAs)	10.26.2004		Impacts on the naturalness, opportunities for solitude, and opportunities for primitive recreation of the WSA.
OTHER RESOURCES / CONCERNS*				
-	Rangeland Health Standards and Guidelines	10.26.2004	Marc Staupoulos	Impacts on rangeland health standards from fire management actions will be addressed in the water, soils, vegetation, and riparian sections of this EA.
PI	Livestock Grazing	10.26.2004	Marc Staupoulos	Impact to allotment use.
PI	Woodlands / Forestry	10.26.2004	Troy Suwyn	Potential for vegetation conversion.

NP/NI/ PI NC	Resource	Date Reviewe d	Signature	Review Comments (required for all NIs and PIs. PIs require further analysis.)
PI	Vegetation, including Plant Special Status Species (SSS)	10.26.200 4	Robert Specht	Impacts on vegetation, including SSS plant species, from fire.
PI	Fish and Wildlife, including SSS	10.26.200 4	Tim Faircloth	Impacts on fish and wildlife (including SSS) species and potential/occupied habitat. Impacts on crucial seasonal habitats.
PI	Soils	10.26.200 4	Dylan Tucker	Issue: Impact to soils.
PI	Recreation	10.26.200 4	Kim Bartel	Issue: Impacts on developed recreation sites / facilities.
NI	Visual Resources	10.26.200 4	Kim Bartel	Visual resources would be degraded in the short term, but would improve to surpass existing conditions as more diverse and more desirable vegetation becomes established. The same would be true for wilderness values. As a greater variety of vegetation presents itself, positive changes to texture, color, and line may be apparent. As conifers are thinned, and more shrubs appear, more visual variety exists, in the long term. Identification of visual resource management classes for individual field offices may be helpful.
NI	Geology / Mineral Resources	10.26.200 4	Kirk Fleetwood	The Proposed Action includes resource protection measures (RPMs) to address concern of suppression of wildland fire in presence of oil and gas facilities. Mitigation measures may be added to future, site-specific Proposed Actions as a result of site-specific analysis during project-level planning for treatment.
NI	Paleontology	10.26.200 4	John Meyers	RPMs resolve concerns regarding fire management impacts on paleontological resources. In the event that paleontological resources are discovered in the course of ground-disturbing activities, effort should be made to protect these resources. Further, BLM Manual and Handbook H-8270-I, Chapter III (A) and III (B) would be used to plan and implement projects. Further, the Proposed Action includes a RPM that directs use of heavy equipment to avoid rock outcrops.

NP/NI/ PI NC	Resource	Date Reviewed	Signature	Review Comments (required for all NIs and PIs. PIs require further analysis.)
NI	Lands / Access	10.26.2004	Paul Rodriguez	While lands and access concerns are present in the planning area, fire management practices would be designed to avoid conflicts with authorized rights-of-way. Prior to planned activities, appropriate coordination would take place with holders of rights-of-way as well as with private and cooperating agency land owners, and additional RPMs would be incorporated into Proposed Actions as needed. Protection of infrastructure is an overriding priority of the proposed management actions. Concerns relating to lands and access during planned activities have been considered with the inclusion of the following RPMs in the Proposed Action: "Fire management practices would be designed to avoid or otherwise ensure the protection of authorized rights-of-way and other facilities located on the public lands, including coordination with holders of major rights-of-way systems within rights-of-way corridors and communication sites."
PI	Fuels / Fire Management	10.26.2004	Steve Strong	Fire and fuels management considerations form the basis for the Proposed Action. Therefore, fire and fuels management is considered and addressed in full in this EA. The objective of the fire management plan is to provide management direction for this resource, in consideration of other resources.
PI	Socioeconomics	10.26.2004	Jean Nitschke-Sinclear	Impacts on socioeconomics. Fire management actions have the potential to impact the socioeconomic status of a wide array of public land users, including rights-of way holders, special use permit holders, licensed livestock operators, American Indian tribes, local communities, and other government entities, including federal, state, county, and municipal units. Impacts on individuals, local communities, American Indian tribes, and others can be both short term and long term in duration and positive and negative in nature.
PI	Wild Horses and Burros	10.26.2004	Del Clark	Impact to herd management area.
PI	Wilderness Characteristics	10.26.2004	Kim Bartel	Impacts from fire management actions to the naturalness, opportunities for solitude and primitive recreation, and any supplemental values.

FINAL REVIEW

Reviewer Title Date		Signature	Comments
NEPA / Environmental Coordinator	11.5.2004	/s/ Steve Strong	
Manager	11.5.2004	/s/ Bill Stringer	

Appendix B

Wildland Fire Management Legislation

Wildland Fire Management Legislation

Authority: The statutes cited herein authorize and provide the means for managing wildland fires.	
Protection Act of September 20, 1922 (42 Stat. 857; 16 USC 594)	Authorizes the Secretary of Interior to protect (and preserve, from fire, disease, or the ravages of beetles or other insects), timber owned by the United States upon the public lands, national parks, national monuments, Indian reservations, or other lands under the jurisdiction of the Department of Interior (DOI) owned by the United States.
Clark-McNary Act of 1928 (45 Stat. 221; 16 USC 487)	Authorizes technical and financial assistance to the states for forest fire control and for production and distribution of forest tree seedlings. (Sections One through Four were repealed by the Cooperative Forestry Assistance Act of 1978.)
Federal Property and Administrative Service Act of 1949 (40 USC 471 et seq.)	Provides the government an economical and efficient system for procurement and supply of personal property and non-personal services.
Reciprocal Fire Protection Act, Act of May 27, 1955 (69 Stat. 66; 42 USC 1856a, 42 USC 1856)	Authorizes agencies that provide fire protection for any property of the United States to enter into reciprocal agreements with other fire organizations to provide mutual aid for fire protection.
Clean Air Act, Act of July 14, 1955, as amended (42 USC 7401 et seq.)	Provides for the protection and enhancement of the nation's air resources and applies to the application and management of prescribed fire.
Wilderness Act, Act of September 3, 1964 (16 USC 1131, 1132)	Provides for the designation and preservation of wilderness.
National Wildlife Refuge System Administration Act of 1966, as amended (80 Stat. 927; 16 USC 668dd through 668ee)	Provides guidelines and directives for administration and management of all areas in the National Wildlife Refuge System, including "wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas."
National Environmental Policy Act of 1969 (42 USC 4321)	Requires the preparation of environmental impact statements for federal projects that may have a significant effect on the environment. It requires systematic, interdisciplinary planning to ensure the integrated use of the natural and social sciences and the environmental design arts in making decisions about major federal actions that may have a significant effect on the environment.
Endangered Species Act of 1973 (16 USC 1531)	Provides for the protection and conservation of threatened and endangered fish, wildlife, and plant species. Directs all federal agencies to utilize their authorities and programs to further the purpose of the Act.
Disaster Relief Act, Act of May 22, 1974 (88 Stat. 143; 42 USC 5121)	Provides the authority for the federal government to respond to disasters and emergencies. Established the presidential declaration process and authorized disaster assistance programs.
Federal Fire Prevention and Control Act, Act of October 29, 1974 (88 Stat. 1535; 15 USC 2201)	Authorizes reimbursement to state and local fire services for costs incurred in firefighting on federal property.
Federal Land Policy and Management Act of 1976 (90 Stat. 2743)	Outlines functions of the BLM Directorate, provides for administration of public land through the BLM, provides for management of the public lands on a multiple use basis, and requires land-use planning including public involvement and continuing inventory of resources. The Act establishes as public policy that, in general, the public lands would remain in federal ownership.
Federal Grant and Cooperative Agreement Act of 1977 (PL 950224,	Establishes criteria for a federal agency to use to determine whether a transaction is procurement or financial assistance. Establishes guidelines to

as amended by PL 97-258, September 13, 1982, 96 Stat. 1003; 31 USC 6301 thru 6308)	bring about uniformity in the selection and use of procurement contracts, grants, and cooperative agreements.
Supplemental Appropriation Act, Act of September 10, 1982 (96 Stat. 837)	Authorizes the Secretary of Interior and Secretary of Agriculture to enter into contracts with state and local governmental entities, including local fire districts, for procurement of services in the preparedness, detection, and suppression of fires on any units within their jurisdiction.
Wildfire Suppression Assistance Act, Act of April 7, 1989 (PL 100-428, as amended by PL 101-11, April 7, 1989; 42 USC 1856).	Authorizes the Secretary of Agriculture to enter into agreements with fire organizations of foreign countries for assistance in wildfire protection.
Indian Self-determination and Education Assistance Act (PL 93-638), as amended	Provides for the full participation of Indian tribes in programs and services conducted by the federal government for Indians and encouraged the development of human resources of the Indian people; establishes a program of assistance to upgrade Indian education.
National Indian Forest Resources Management Act (PL 101-630, November 28, 1990)	Requires the Secretary of Interior to undertake management activities on Indian forestlands, in furtherance of the United States trust responsibility for these lands. Activities must incorporate the principles of sustained yield and multiple use, and include tribal participation.
Tribal Self-governance Act of 1994 (PL 103-413)	Provides for native tribes to enter into annual funding agreements with DOI "to plan, conduct, consolidate, and administer programs, services, functions, and activities" administered by DOI that are of special geographic, historical, or cultural significance.
Clean Water Act of 1987, as amended (33 USC 1251)	Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.
Executive Order 12898, Environmental Justice, February 11, 1994 (59 FR 7629)	Requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.
Executive Order 13112, Invasive Species, February 3, 1999 (64 FR 6183)	Directs federal agencies to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.
Migratory Bird Conservation Act of 1929, as amended (16 USC 715) and treaties pertaining thereto	Provides for habitat protection and enhancement of protected migratory birds.
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001 (66 FR 3853)	Directs agencies within the executive branch to take certain actions to further implement the Migratory Bird Treaty Act, with the goal of promoting the conservation of migratory bird populations.
Wild and Scenic Rivers Act (PL 90-542)	Provides a national policy and program to preserve and protect selected rivers because of their outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values.
Archaeological Resource Protection Act	Expands the protections provided by the Antiquities Act of 1906 in protecting archaeological resources and sites located on public and Indian lands.
Executive Order 11514, Protection and Enhancement of Environmental Quality	Directs federal agencies to provide leadership in protecting and enhancing the quality of the nation's environment to sustain and enrich human life and to initiate measures to meet national environmental goals.
Executive Order 11593, Protection and Enhancement of the Cultural Environment	Requires federal agencies to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the nation by administering and initiating measures necessary to preserve, restore, and maintain federally owned sites, structures, and objects of historical,

	architectural, or archaeological significance.
Executive Order 11988, Floodplain Management	Requires federal agencies to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains.
Executive Order 11990, Protection of Wetlands	Directs federal agencies to provide leadership and to take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
Executive Order 12866, Regulatory Planning and Review	Enhances planning and coordination with respect to both new and existing regulations; reaffirms the primacy of federal agencies in the regulatory decision-making process; restores the integrity and legitimacy of regulatory review and oversight; and makes the process more accessible and open to the public.
Colorado River Basin Salinity Control Act	Authorizes the construction, operation, and maintenance of works in the Colorado River Basin to control the salinity levels of the Colorado River.
National Historic Preservation Act of 1966, as amended (16 USC 470)	Expands protection of historic and archaeological properties to include those of national, state, and local significance. It also directs federal agencies to consider the effects of Proposed Actions on properties eligible for, or included in, the National Register of Historic Places.
Healthy Forest Restoration Act of 2003	Reduces the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes.
Wild and Scenic Rivers Act of 1968 (PL 90-542, as amended) (16 USC 1271-1287)	Provides for a National Wild and Scenic Rivers Systems and for other purposes.
These acts are codified (as referenced) in the United States Code that can be accessed at http://www4.law.cornell.edu/uscode .	
Policy Documents	
Federal Wildland Fire Management Policy and Program Review, December 18, 1995, USDI and USDA Final Report. Federal Wildland Fire Management Policy and Program Review, March 23, 1996, USDI and USDA Implementation Action Plan Review and Update of the 1995 Federal Wildland Fire Management Policy, January, 2001, USDI, USDA, DOE, DOD, DOC, EPA, FEMA, and NASF.	Provide a common approach to wildland fire by the DOI and Department of Agriculture. The plan encourages agencies to move the emphasis from fire suppression to integrating fire into the management of lands and resources consistent with public health and environmental quality considerations. Managers are encouraged to use fire as one of the basic tools for accomplishing resource management objectives
Utah BLM Rangeland Health Standards and Guidelines, 1997.	Provides standards that spell out conditions to be achieved on BLM lands in Utah and guidelines that would be applied to achieve the standards.
Western Governor's Association (http://www.westgov.org/)	
A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy, August 2001.	Outlines a comprehensive approach to the management of wildland fire, hazardous fuels, and ecosystem restoration and rehabilitation on federal and adjacent state, tribal, and private forest and rangelands in the United States, emphasizing measures to reduce the risk to communities and the environment
A Collaborative Approach for	Sets forth core principles was developed to guide the identification of

<i>Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy Implementation Plan, May 2002, 27p.</i>	goals for this strategy. These principles include such concepts as priority setting, accountability, and an open, collaborative process among multiple levels of government and a range of interests. The end results sought by all stakeholders are healthier watersheds, enhanced community protection, and diminished risk and consequences of severe wildland fires. This community-based approach to wildland fire issues combines cost-effective fire preparedness and suppression to protect communities and the environment with a proactive approach that recognizes fire as part of a healthy, sustainable ecosystem.
<i>National Academy of Public Administration (http://www.napawash.org/)</i>	
<i>Federal Fire Management: Limited Progress in Restarting the Prescribed Fire Program (GAO/RCED-91-42), December 5, 1990.</i>	Reiterates that fire is beneficial and even necessary to wildlands. Where fire has been a historic component of the environment it is essential to continue that influence, and that attempts to exclude fire from such lands could result in unnatural ecological changes and increased risks created by accumulation of fuels on the forest floor. Supports the use of prescribed burn to achieve management objectives, when the risks of such a burn have been analyzed.
<i>State of Utah Regulations and Local Government Plans</i>	
<i>Utah Administrative Code R317</i>	Sets forth Utah regulation concerning water quality.
<i>Utah Administrative Code R307</i>	Sets forth Utah's regulation concerning air quality.
<i>Uintah Basin Association of Government 2004</i>	Sets forth a pre-disaster mitigation plan comprising Daggett, Duchesne, and Uintah Counties.

Appendix C

Wildland Fire Management Categories

Wildland Fire Management Categories

For the purposes of comparing the No Action with the Proposed Action in this environmental assessment, the planning areas for both alternatives were divided into four fire management categories that define the role and response that wildland fire has in a particular ecosystem. These four fire management categories were labeled A, B, C, and D, and are defined below.

Category A: Wildland fire is not desired.

Category A is designated for two reasons. First, wildland fires in these areas have adverse environmental impacts on the ecosystem. The second reason for designating an area as a Category A is related to adverse impacts to social, economic, and/or political issues.

Category A areas are where fire return intervals were historically long, or where fire has more harmful impacts than benefits. Fire now is not desired because these areas have altered vegetation due to past fire exclusion and land uses and high potential for invasion of exotic species such as cheatgrass. Introduction of these exotic species has changed the size and interval of fires and has altered the natural species composition of the sites disrupting the natural succession of the native plant communities. As a result, increased size and frequency of fires allows continued and increased disturbance to native plant communities, destroys wildlife habitat, and produces other adverse impacts to the ecosystem. Because the native species generally lack an ability to out-compete introduced and exotic species following a fire, rehabilitation projects are required to establish desirable vegetation and prevent soil loss and other undesirable natural consequences. Key examples include the salt desert shrub, black sagebrush, and Wyoming big sagebrush shrub communities.

Prescribed fire is generally not recommended in this category due to fire's adverse environmental impacts. However, prescribed fire and non-fire fuel treatments may be used to establish fuelbreaks and perform hazardous fuel reduction when the benefits of mitigating the potential for a large spreading fire outweigh the impacts of the fuels management project. Fire and non-fire treatments may be used as part of a restoration or rehabilitation program.

Category B: Wildland fire would likely cause negative effects, but effects may be mitigated by management actions.

Wildland fires in Category B produce similar adverse and harmful impacts as in Category A due to altered vegetation conditions in these areas. The general objective is to limit and suppress wildland fires within these areas. However, Category B areas may respond positively to properly managed and planned prescribed fires..

Prescribed fires and other fuel treatments (mechanical manipulation, seeding of less flammable and more desirable species, vegetation greenstripping, and other techniques) can improve vegetation diversity and/or revitalize plant communities through restoration and rehabilitation. Treatments may be used to reduce hazardous fuel loadings, thus mitigating and reducing the impacts should a wildland fire occur. The key examples are those areas where the absence of fires has resulted in replacement of diverse vegetation communities with monotypic stands of less desirable species. These areas include dense stands of juniper or decadent stands of Wyoming big sagebrush. These plant communities may have little vegetation and age class diversity, resulting in accumulations of hazardous and volatile fuels.

Category C: Wildland fire is desired to manage ecosystems, but there are constraints. Wildland fire use is appropriate.

The vegetation conditions are somewhat altered, but not to the degree in Categories A and B. The existing native vegetation would naturally re-vegetate after fire. Key ecosystem examples include juniper with perennial grasslands, aspen groves and Wyoming big sagebrush with perennial grasses, and other upper

elevation plant communities. Although these ecosystems benefit from both unplanned wildland fires and planned prescribed fires, use of either as a management tool may be limited by constraints. These constraints include threats to private property, smoke impacts, lack of manageable fire boundaries, political concerns, cultural resources, and sensitive species. The appropriate fire management response may utilize less aggressive suppression strategies and tactics that result in more acreage burned than under a more aggressive fire suppression response.

Prescribed fire in these areas is desired to meet resource management objectives and reduce hazardous fuels. Fuels management would be necessary to define more manageable wildland fire boundaries, to protect and minimize the severity and impact of wildland fires on existing plant communities, and to protect values in adjacent units (i.e.: resource values, developments, etc.). Fuels management activities may involve prescribed fire, mechanical manipulation, fuelbreak development, and other management techniques.

Category D: Wildland fire may burn with few constraints associated with resource conditions, social, economic, or political considerations. Wildland fire use is appropriate.

The ecosystem response of these areas is similar to Category C, except there are fewer constraints to the use of fire. Most often the appropriate fire management response in these areas is to monitor the fire and let the fire play out its natural role in the ecosystem. There are few threats to resource values, improvements, or adjacent ownerships. Prescribed fire and non-fire fuel treatments would be used similarly to Category C.

Appendix D
Summary of Goals and Objectives by Fire Management Unit for
the Vernal Proposed Action

**Summary of Goals and Objectives By Fire Management Unit for the
Vernal Proposed Action**

Vernal FMU	Total FMU Area (acres)	Total BLM Area in FMU (acres)	Per Occurrence Burn Acreage Ceiling	10 year Burn Acreage Ceiling	Wildland Fire Use	Prescribed Fire (10 year acreage estimates in veg type)	Non-Fire Treatment (10-year acreage estimation veg type)	Other Goals and Objectives
A-1 River Corridors	87,324	52,287	2 CW 50 GW	100 CW 100 GW	NA	1,000 TSK	Determined on a site-specific basis.	Prevent wildland fires from spreading within and into adjacent cottonwood stands.
A-2 North Uintah Basin	633,862	441,252	50WBS 10 SDS 10 CG	500 WBS 50 SDS 50 CG	N/A	1,000 WBS	Determined on a site-specific basis.	Prevent wildland fires from spreading into the salt desert shrub and sagebrush types.
A-3 Myton Bench (Pariette wet)	168,415	149,025	50 WBS 10 SDS	500 WBS 50 SDS	N/A	30-40 CT	Determined on a site-specific basis.	Prevent wildland fires from spreading into the salt desert shrub and sagebrush types. Allow for burning of cattails at the various ponds and reservoirs at the Pariette Wetlands. Approximately 30-40 acres of cattails would be ignited per year. Burning would occur during late winter, prior to green up.
A-4 South Uintah Basin	108,490	80,146	50 WBS 10 SDS	500 WBS 50 SDS	N/A	300 WBS	Determined on a site-specific basis.	Prevent wildland fires from spreading into the salt desert shrub and sagebrush types.
B-1 Dry Fork	42,452	17,477	25	5,000	N/A	500	500 mechanical	Prevent wildland fires from spreading to adjacent private lands where structures and other developments are located.
B-2 Browns Park	17,993	14,697	25 WBS	500 WBS	N/A	500	500 mechanical	Prevent wildland fires from spreading to adjacent private lands where structures and other developments are located.

Vernal FMU	Total FMU Area (acres)	Total BLM Area in FMU (acres)	Per Occurrence Burn Acreage Ceiling	10 year Burn Acreage Ceiling	Wildland Fire Use	Prescribed Fire (10 year acreage estimates in veg type)	Non-Fire Treatment (10-year acreage estimation veg type)	Other Goals and Objectives
B-3 Blue Mtn Plateau	14,306	9,910	25 MS	500 MS	N/A	500	500 mechanical	Prevent wildfires from spreading onto adjacent private lands on Taylor Flat, and to existing developments on public lands.
B-4 Lower Bookcliffs	276,638	206,865	25 WBS 25 PJ	500 WBS 5000 PJ	N/A	200 WBS 500 PJ	500 mechanical	Prevent wildland fires from spreading form the Pinyon-Juniper type to the adjacent Wyoming sagebrush types.
B-5 Deadman Bench	59,471	52,953	25 WBS 25 PJ	500 WBS 500 PJ	N/A	500	500 mechanical	Prevent wildfires from spreading to adjacent agency lands and to the oil and gas infrastructure development. Use non fire rehabilitation and restoration treatments to reduce the conversion of sagebrush to the annual cheatgrass type.
B-6 Lower Bitter Creek	14,451	9,527	25 GW	1500 GW	N/A	130 GW	500 mechanical	Prevent wildfires from spreading to adjacent agency lands and to the oil and gas infrastructure development. Use non fire rehabilitation and restoration treatments to reduce the conversion of greasewood to the annual cheatgrass type, and to convert the greasewood type back to the riparian/grassy bottom type.
B-7 Argyle Canyon	64,539	12,422	100	500	N/A	100	500 mechanical	Prevent wildland fires from spreading onto adjacent private land.

Vernal FMU	Total FMU Area (acres)	Total BLM Area in FMU (acres)	Per Occurrence Burn Acreage Ceiling	10 year Burn Acreage Ceiling	Wildland Fire Use	Prescribed Fire (10 year acreage estimates in veg type)	Non-Fire Treatment (10-year acreage estimation veg type)	Other Goals and Objectives
B-8 Diamond Mtn	43,121	16,044	25	3,500	N/A	350	300 mechanical	The desired mix of seral stages, sagebrush restoration/rehabilitation and woodland/forest management would be achieved through prescribed fire, & mechanical/chemical treatments. Prevent wildland fires from spreading onto adjacent private land.
B-9 Goslin Mtn	13,996	12,054	25 MS 200 PJ	500	N/A	500	100 mechanical	Prevent wildland fires from spreading onto adjacent private land.
B-10 Bender Mtn	8,014	6,074	25	3,000	N/A	3,000	100 mechanical	Prevent wildland fires from spreading onto adjacent private land.
C-1 East Diamond Mtn	199,804	115,001	25 MS/WBS 200 PJ 10 PD	3,000	As appropriate	3,000	500 mechanical	Prevent wildland fires from spreading onto adjacent private land.
C-2 Little Mtn	23,332	16,205	25 MS 200 PJ	2,500	As appropriate	2,000	500 mechanical	Prevent wildland fires from spreading onto adjacent private land.
C-3 Three Corners	16,160	9,602	200	3,000	As appropriate	1,750	500 mechanical	Prevent wildland fires from spreading onto adjacent non-federal lands.
C-4 Upper Myton Bench	149,054	124,525	200	10,000	As appropriate	1,750	500 mechanical	Prevent wildland fires from spreading onto adjacent non-federal lands.
C-5 Cliff Ridge	26,597	22,602	200	3,000	As appropriate	1,750	500 mechanical	Prevent wildland fires from spreading onto adjacent non-federal lands.

Vernal FMU	Total FMU Area (acres)	Total BLM Area in FMU (acres)	Per Occurrence Burn Acreage Ceiling	10 year Burn Acreage Ceiling	Wildland Fire Use	Prescribed Fire (10 year acreage estimates in veg type)	Non-Fire Treatment (10-year acreage estimation veg type)	Other Goals and Objectives
C-6 Upper Bookcliffs	417,705	287,310	25 FWS 200 MS 200 MB 200 PJ 200 DFA	20,000 MB 45,000 PJ 8,000 DFA 40,000 MS	As appropriate	113,000	1000 mechanical	Aspen stands would be managed to maintain or enhance distribution, density, regeneration and sustainability and to favor regeneration of aspen where deemed appropriate. Stands would be managed for maintenance or enhancement using a variety of methods including harvest cutting or burning. Prevent wildland fires from spreading onto adjacent non-federal lands.
C-7 Antelope Flat	15,182	13,888	200 WBS 200 PJ	750 WBS 2000 PJ	As appropriate	2,500 PJ	2,000 WBS	Prevent wildland fires from spreading onto adjacent non-federal lands.
C-8 Red Mtn	28,065	12,040	50 WBS 5 PD 100 PJ	1,000 PJ (700 target) 100 PD 500 WBS	As appropriate	200	100 mechanical	Prevent wildland fires from spreading onto the private land in the Spring Creek drainage.
C-9 Leers Canyon ACEC	1,411	1,411	200 PJ 50 DF	100 Df 500 PJ	As appropriate	200	100 mechanical	Prevent wildland fires from spreading onto adjacent non-federal lands.
D-1 Winter Ridge WSA	45,971	42,763	200 WBS 200 PJ	1,000 WBS 5,000 PJ	As appropriate	5,000	Not appropriate	Prevent wildland fires from spreading onto adjacent non-federal lands.
D-2 W Cold Springs WSA	3,296	3,296	100 MS 200 PJ	1,000 MS 2000 PJ	As appropriate	1,500	Not appropriate	Prevent wildland fires from spreading onto adjacent non-federal lands.
D-3 Diamond Breaks WSA	3,801	3,801	100 MS 200 PJ	1,000 MS 2,000 PJ	As appropriate	1,600	Not appropriate	Prevent wildland fires from spreading onto adjacent non-federal lands.

Vernal FMU	Total FMU Area (acres)	Total BLM Area in FMU (acres)	Per Occurrence Burn Acreage Ceiling	10 year Burn Acreage Ceiling	Wildland Fire Use	Prescribed Fire (10 year acreage estimates in veg type)	Non-Fire Treatment (10-year acreage estimation veg type)	Other Goals and Objectives
D-4 Daniels Canyon WSA	2,488	2,488	100 MS 500 PJ	1,000 MS 2,000 PJ	As appropriate	1,500	Not appropriate	Prevent wildland fires from spreading onto adjacent non-federal lands.
D-5 Bull Canyon WSA	581	581	20 WBS 100 PJ	100 WBS 400 PJ	As appropriate	1,600	Not appropriate	Prevent wildland fires from spreading onto adjacent non-federal lands.
TOTAL ACRES	2,486,519	1,736,246	5,327	178,350		146,470	9,700	
Abbreviated Vegetation Types: PJ-pinyon and juniper woodland, WBS-Wyoming big sage, MS-sagebrush, SDS-salt desert shrub, PD-ponderosa, TSK-tamarisk infested, FWS-four-wing sagebrush, MB-mountain browse, DFA-Douglas fir-aspen, GW-greasewood, CW-cottonwood								

Appendix E
Resource Protection Measures Applied to Specific Fire
Management Units for the Vernal Proposed Action

Resource Protection Measures Applied to Specific Fire Management Units for the Vernal Proposed Action

Abbreviations for fire management actions:

SUP: Wildfire Suppression

WFU: Wildland Fire Use for Resource Benefit

RX: Prescribed Fire

NF: Non-fire fuels treatments

ESR: Emergency Stabilization and Rehabilitation

CODE	Protection Measures (and applicable fire management practices)	A1	A2	A3	A4	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5
Air Quality																													
A-1	Evaluate weather conditions, including wind speed and atmospheric stability, to predict impacts from smoke from Prescribed Fires and Wildland Fire Use. Coordinate with Utah Department of Environmental Quality for Prescribed Fires and Wildland Fire Use. (RX, WFU)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
A-2	When using chemical fuels reduction methods, follow all label requirements for herbicide application. (NF)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cultural Resources																													
CR-1	Cultural resource advisors should be contacted when fires occur in areas containing sensitive cultural resources. (SUP)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CR-2	Wildland Fire Use is discouraged in areas containing sensitive cultural resources. A Programmatic Agreement is being prepared between the Utah State Historic Preservation Office, BLM, and the Advisory Council to cover the finding of adverse effects to cultural resources associated with Wildland Fire Use. (WFU)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

[illegible]

[illegible]

[illegible]

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[illegible]

E-7

FW-6	Create small openings in continuous or dense sagebrush (>30% canopy cover) to create a mosaic of multiple-age classes and associated understory diversity across the landscape to benefit sagebrush-dependent species. (WFU, RX, NF)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-7	On sites that are currently occupied by forests or woodlands, but historically supported sagebrush communities, implement treatments (fire, cutting, chaining, seeding, etc.) to reestablish sagebrush communities. (RX, NF)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-8	Evaluate and monitor burned areas and continue management restrictions until the recovering and/or seeded plant community reflects the desired condition. (SUP, WFU, RX, ESR)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-9	Utilize the Emergency Stabilization and Rehabilitation program to apply appropriate post-fire treatments within crucial wildlife habitats, including sage-grouse habitats. Minimize seeding with nonnative species that may create a continuous perennial grass cover and restrict establishment of native vegetation. Seed mixtures should be designed to reestablish important seasonal habitat components for sage-grouse. Leks should not be reseeded with plants that change the vegetation height previously found on the lek. Forbs should be stressed in early and late brood-rearing habitats. In situations of limited funds for ESR actions, prioritize rehabilitation of sage-grouse habitats. (ESR)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-10	Seed mixtures should be designed to reestablish important seasonal habitat components for sage-grouse. Leks should not be reseeded with plants that change the vegetation height previously found on the lek. Forbs should be stressed in early and late brood-rearing habitats. In situations of	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

[illegible]

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Appendix F

Federally Listed, Candidate, and Petitioned Species Found Within the Vernal Planning Area

Federally Listed, Candidate, and Petitioned Species Found Within the Vernal Planning Area

Common Name ^a	Scientific Name	Federal Status ^b	Vegetation Community (Substrate Type identified for Flowering Plants only)
Shrubby reed-mustard	<i>Schoenocrambe suffrutescens</i>	Endangered	Salt desert shrub; pinyon and juniper woodland; mountain shrub (calcareous shale)
Clay reed-mustard	<i>Schoenocrambe argillacea</i>	Threatened	Salt desert shrub (shale)
Uinta Basin hookless cactus	<i>Sclerocactus glaucus</i>	Threatened	Salt desert shrub (gravelly loam)
Ute ladies'-tresses (H)	<i>Spiranthes diluvialis</i>	Threatened	Riparian/wetland (hanging gardens)
Horseshoe milk-vetch	<i>Astragalus equisolensis</i>	Candidate	Salt desert shrub; sagebrush (sandy)
Graham's beardtongue	<i>Penstemon grahamii</i>	Candidate	Salt desert shrub; pinyon and juniper woodland (shale)
White River beardtongue	<i>Penstemon scariosus</i> var. <i>albifluvis</i>	Candidate	Salt desert shrub; pinyon and juniper woodland (shale)
Bald eagle (Br)	<i>Haliaeetus leucocephalus</i>	Threatened	Sagebrush; mixed conifer; riparian/wetland
Mexican spotted owl* (Br)	<i>Strix occidentalis lucida</i>	Threatened	Pinyon and juniper woodland; sagebrush; riparian/wetland
Western yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate	Riparian/wetland
Black-footed ferret (H, Exp, Un)	<i>Mustela nigripes</i>	Endangered, 10(j)	Sagebrush; grassland
Canada lynx (H)	<i>Lynx canadensis</i>	Threatened	Mixed conifer
Humpback chub* (H)	<i>Gila cypha</i>	Endangered	Water
Bonytail* (H)	<i>Gila elegans</i>	Endangered	Water
Colorado pikeminnow (=squawfish)* (H)	<i>Ptychocheilus lucius</i>	Endangered	Water
Razorback sucker* (H)	<i>Xyrauchen texanus</i>	Endangered	Water

^a Definitions for notations:

* Species with designated critical habitat.

** Species with proposed critical habitat.

Br – Species known to nest or breed within the planning area.

H – Species or populations existed in historical locations (i.e., the current range or number of individuals or populations has decreased when compared to historical standards). For extirpated species, all management areas are considered historical.

Exp – Management areas contain designated use areas for experimental, nonessential populations designated under Section 10(j) of the Endangered Species Act (ESA), as amended.

I – Management areas contain introduced, refugia populations of the species.

Un – Management areas contain unconfirmed historical locations of the species.

^b Definitions for species status:

Endangered Species – Species or distinct populations listed by USFWS that have a probability of worldwide extinction.

Threatened Species – Species or distinct populations listed by USFWS that are threatened with becoming endangered.

Candidate and Petitioned Species – No legal protection under ESA, as amended. However, USFWS has sufficient information on biological vulnerability and threats to candidate species that they are under active consideration by USFWS for federal listing. For petitioned species, outside entities have submitted petitions to USFWS to consider these species for federal listing. Candidate or petitioned species could be proposed or listed during the life of the proposed action for this project.

10(j) Species – Considered by the USFWS to be “experimental and non-essential populations” within designated use areas in Utah, as provided by Section 10(j) of the ESA, as amended. This designation provides greater management flexibility. For BLM, 10(j) populations of federally listed species are equivalent to a “proposed” status.

Extirpated Species – Federally endangered, threatened, or candidate species considered by USFWS to no longer occur in Utah.

Appendix G
BLM Sensitive Species Found Within the Vernal Planning Area

BLM Sensitive Species Found Within the Vernal Planning Area

Common Name ^a	Scientific Name	Federal Status ^b	Vegetation Community (Substrate type identified for flowering plants only)
Park rockcress	<i>Arabis vivariensis</i>	SPS	Salt desert shrub; pinyon and juniper woodland (limestone, sandstone)
Hamilton milk-vetch	<i>Astragalus hamiltonii</i>	SPS	Salt desert shrub; pinyon and juniper woodland (sandy)
Ownbey thistle	<i>Cirsium ownbeyi</i>	SPS	Pinyon and juniper woodland; sagebrush; riparian/wetland (sandy)
Untermann daisy	<i>Erigeron untermannii</i>	SPS	Pinyon and juniper woodland; sagebrush; mountain shrub; mixed conifer (calcareous, sandstone, shale)
Alcove bog-orchid	<i>Habenaria zothecina</i>	SPS	Riparian/wetland (hanging gardens)
Rock hymenoxys	<i>Hymenoxys lapidicola</i>	SPS	Pinyon and juniper woodland; mountain shrub; ponderosa pine (rocks/crevices/ledges, sandstone, sandy)
Huber's pepperweed	<i>Lepidium huberi</i>	SPS	Sagebrush; mountain shrub; mixed conifer; ponderosa pine (sandy)
Stemless penstemon	<i>Penstemon acaulis</i>	SPS	Pinyon and juniper woodland; sagebrush (clay, sandy)
Flowers penstemon	<i>Penstemon flowersii</i>	SPS	Salt desert shrub (clay)
Gibbens penstemon (Gibbens beardtongue)	<i>Penstemon gibbensii</i>	SPS	Salt desert shrub; pinyon and juniper woodland (clay, shale)
Goodrich penstemon (Goodrich beartongue)	<i>Penstemon goodrichii</i>	SPS	Salt desert shrub; pinyon and juniper woodland; mountain shrub (clay)
Northern goshawk	<i>Accipiter gentiles</i>	CA	Mixed conifer; riparian/wetland
Grasshopper sparrow	<i>Ammodramus savannarum</i>	WSC	Grassland
Burrowing owl	<i>Athene cunicularia</i>	WSC	Grassland
Ferruginous hawk	<i>Buteo regalis</i>	WSC	Sagebrush; grassland
Bobolink	<i>Dolichonyx oryzivorus</i>	WSC	Riparian/wetland
Lewis's woodpecker	<i>Melanerpes lewis</i>	WSC	Pinyon and juniper woodland; mountain shrub; mixed conifer; ponderosa pine; riparian/wetland
Long-billed curlew	<i>Numenius americanus</i>	WSC	Grassland
American white pelican	<i>Pelecanus erythrorhynchos</i>	WSC	Riparian/wetland
Mountain plover	<i>Charadrius montanus</i>	WSC	Salt desert shrub; sagebrush; grassland
Three-toed woodpecker	<i>Picoides tridactylus</i>	WSC	Mixed conifer; aspen
Greater sage grouse	<i>Centrocercus urophasianus</i>	WSC	Sagebrush
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	WSC	Mountain shrub; mixed conifer
White-tailed prairie dog	<i>Cynomys leucurus</i>	WSC	Sagebrush
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	CA	Water
Roundtail chub	<i>Gila robusta</i>	CA	Water
Bluehead sucker	<i>Catostomus discobolus</i>	CA	Water
Flannelmouth sucker	<i>Catostomus latipinnis</i>	CA	Water
Smooth greensnake	<i>Opheodrys vernalis</i>	WSC	Sagebrush; riparian/wetland

^a Species already represented as federally listed, candidate, or petitioned species are not repeated here. Sources of information: UDEQ 2003; BLM 2002b.

^b BLM sensitive species status designations are CA: Conservation Agreement, WSC: Wildlife Species of Concern, and SPS: Sensitive Plant Species. CA species receive special management under a CA to preclude the need for listing.

Appendix H

Fire's Interaction with Resources

Fire's Interaction with Resources

Fire's Interaction with Areas of Critical Environmental Concern

In many cases, fire is a natural part of the character of an area. However, fire could damage or destroy the relevant and important values for which each area of critical environmental concern (ACEC) was originally designated. (See the Cultural Resources, Special Status Species, Vegetation, and Fish and Wildlife sections of Chapter 4.) These disturbances, with some exceptions, would often be temporary and short-term, while relevant and important values are assessed on a long-term scale.

Fire's Interaction with Cultural Resources

An understanding of how fire affects cultural resources is necessary in order to analyze the impact of proposed management actions covered in Chapter 4. These interactions are context-dependent and vary by temperature and duration of exposure to heat. Generally, higher temperatures and/or longer duration of exposure to heat increase the potential for damage to cultural resources. Variables that affect temperature and duration include type of fuel, fuel load and distribution, fuel moisture and soil type and moisture. As a rule, fire does not affect buried cultural materials. Studies show that even a few centimeters of soil cover (10 cm) are sufficient to protect cultural materials (Oster n.d.). However, there are times when conditions do carry heat below the surface, with the potential to affect buried materials. These conditions include stumps, heavy duff, surface logs, and roots that smolder and burn. Fires that burn hot and fast through a site may have less of an affect on certain types of cultural materials than fires that smolder in the duff or logs that burn for a period of time.

Prehistoric and historic resources potentially affected by fire may be inorganic (lithic, ceramics, cans, glass, rock art, etc.) or organic (basketry, wooden structures, dendroglyphs, etc.). Certain resources that are important for dating archaeological sites may also be affected. Generally, organic materials are more at risk as they tend to burn or alter at lower temperatures than inorganic items.

Fire can affect chipped and groundstone tools through changes in morphology rather than in chemistry. Exposure to heat and rapid cooling may cause fracturing, potlidding, crazing, shattering, and changes in color and internal luster, which might reduce an artifact's ability to render information about the past. Deal (n.d.), Buenger (2003), Loyd et al. (2002), Shackley and Dillian (2002), and Waechter (n.d.) provide data concerning the effects of temperature on obsidian, various silicates (including chert), basalt, and sandstone used for groundstone. Generally, hotter temperatures and longer exposure to fire may affect lithic materials. It may be necessary to take protective measures when these materials are likely to be present.

Different types of clays, inclusions and manufacturing techniques lead to different effects among distinct ceramic types. Heat damage is not as significant a consideration for this artifact type as it is for others. Generally, structural damage does not occur until temperatures exceed the original firing temperature. The main type of damage noted is to the surface decoration or glaze (Andrews 2004; Rude and Jones n.d.). Pyne et al. (1996) suggest that when fires remain below 500° C and occur within 30 minutes (as is typical for prescribed burns), little damage to artifacts and resources even at shallow depths is likely to occur.

Inorganic historic artifacts are generally safe from fire, but some artifacts such as soldered cans may melt at temperatures as low as 137 to 177° C (Haecker n.d.). Can morphology may be damaged and ceramic artifacts may crackle or spall in lower temperature fires. Other materials, such as machinery utilized in historic mining, are less susceptible. Inorganic structures constructed of sandstone, adobe, cement-mortared fieldstone, firebrick, cinder block or cement aggregate are generally fire-resistant. Fracturing and spalling may occur at 700° C (Buenger 2003). Wooden sub-structures (common in adobe structures) would be destroyed, possibly compromising the structure as a whole. Historic earthworks such as trails, roads, irrigation ditches, canals, etc. are less sensitive to fire.

Fire has the potential to damage to rock art. Though there are no specific temperature guidelines for rock art, fire effects include soot smudging and discoloration from smoke, which obscure the rock art images; degradation of the rock surface from spalling, exfoliation and increased weathering; changes in organic paints due to heat; and damage to rock varnish which may destroy its potential to date the art (Tratebas 2004; Kelly and McCarthy 2001).

Organic artifacts (e.g., basketry, digging sticks, clothing, textiles) and features (e.g., structures, bow-stave trees, wikiups, culturally modified trees, historic timber structures) made of or containing organics such as wood, leather and hide or cordage need protection or treatment before any fire burns through a site containing such items. Bone and shell can sustain some degree of burning without complete destruction (Buenger 2003). Plant and animal residues may survive exposure to fire. Pollen may be destroyed at temperatures greater than 300° C (572° F), but animal proteins survive to 800° C (1472° F).

Determining temporal context is an important part of archaeology. Fire has the potential to adversely impact the dating potential of archaeological data. Fire is likely to destroy organic material such as bone, wood or charcoal that yield radiocarbon dates. Fire can modify or destroy obsidian hydration rinds, thus compromising obsidian hydration dates (Deal n.d.; Buenger 2003; Loyd et al. 2002; Shackley and Dillian 2002; Solomon 2002). Finally, temperatures that exceed original firing temperatures (generally 400° C) would destroy the potential for thermoluminescence dating of ceramics (Rude and Jones n.d.).

Fire's Interactions with Floodplain Resources

Direct effects of fire on floodplains are primarily associated with loss (burning) of vegetation that may be growing on the floodplain. Damage to vegetation may result in the loss of root structure, therefore resulting in reduced channel stability and changes in the stream flow paths and erosion rates. Indirect impacts to floodplains from fire include the potential for increased sediment transport rates, deposition of soil, and changes to water quality due to upstream watershed events. Impacts to floodplains due to fire may be closely associated with effects of fire on soil and water, as discussed in the Soils and Water Quality sections of Chapter 4.

Fire's Interaction with Invasive and Non-Native Species

Musk thistle is spreading into sagebrush and pinyon and juniper woodland types. Following fire, musk thistle produces abundant seed. Fire creates conditions that are favorable to the establishment of musk thistle (i.e. open canopy, reduced competition, areas of bare soil), making it likely to spread if seeds are present.

In Utah, houndstongue may be found in sagebrush, pinyon and juniper woodland, cottonwood, mountain shrub, aspen, and ponderosa pine communities. Fire creates conditions that are favorable for establishment of houndstongue (i.e. open canopy, reduced competition, areas of bare soil), so if houndstongue seeds are present and competition minimal, it may be favored in the post-fire community. Houndstongue plants may also survive fire, since nutrient reserves in the taproot acquired during the first year are sufficient for normal seed production the following year, even if the plants are completely defoliated early in the spring.

Black henbane is toxic to humans and animals when ingested. Plants sprout when the seed are exposed to sunlight and is mostly found in disturbed areas. Like most invasive, non-natives, fire creates favorable conditions for the proliferation and spread of this plant.

Wherever cheatgrass or red brome dominate, the prevailing fire regime condition class (FRCC) is 3 due to the loss of key ecosystem components such as native species. The establishment of these invasive grasses fosters much more frequent fire-return intervals. The presence of grass in a wildland community extends the time during which the community is susceptible to wildland fire ignitions. In the summer, cheatgrass dries out

four to six weeks earlier than perennial grasses and forms a fine-textured, highly flammable fuel. Cheatgrass may also be susceptible to fire one to two months longer in the fall (Paysen et. al. 2000). Dead culms and stems of red brome may persist on the average for two years, promoting fast, hot fires where abundant.

It is expected that as tamarisk continues to increase, desirable native communities such as willows would decrease, resulting in lower biodiversity, inferior wildlife habitat, and shortened fire intervals. Tamarisk does provide, however, streambank stability.

Because it is considered a halophyte, tamarisk is better adapted to persist in an environment of frequent fires than native willows (soil salinity tends to increase following fire). Even though tamarisk foliage has a high salt and water content, making it somewhat inflammable, it builds up senescent woody material within its branches, resulting in increased flammability. This combined with repeated fire disturbance results in impenetrable thickets that shade-out native plants like willows, which require direct sunlight.

The response of knapweeds to fire is unclear and appears to differ regionally, by density of infestation, the time of year, and the severity of fire (Tirmenstein 1999). Even if they are top-killed by fire, which may weaken the plant, it is likely they would still survive due to their long taproots (in the case of Russian knapweed these roots can penetrate over 23 feet deep). They accomplish this by re-sprouting from the taproot if the root crown is not killed. In addition, if any infested areas are left unburned, they readily establish in burned areas by dispersing seed through a tumbleweed action. They appear to be most vulnerable to fire in the seedling and rosette stages.

Fire's Interaction with Native American Religious Concerns

The presence of fire prehistorically and historically in the planning area is an integral part of the landscape and by association the traditional belief system of Native Americans. Fire in its natural form, where the occurrence of more but lower severity events are more typical relative to current events, represent a continuation of the cycle of life intertwined in Native American beliefs. Both high- and low-severity fires have the potential to impact the physical characteristics of features considered part of Native American religions. These may include destruction of constructed features and changes to the visual characteristics of a place important to a Native American belief system. The occurrence of high-severity fires would increase the chance that these changes would be longer lasting and alter the properties to a greater degree.

Fire's Interaction with Special Status Species

Effects of fire on special status species and their habitat vary widely depending upon the size and intensity of the fire, fuel type, location, topography, season, and duration. High-severity wind and fire can destroy large areas of habitat and make recovery of those habitats a long process. Both low- and high-severity wildland fire can destroy important habitat, displace animal species, and inflict direct mortality. However, low-severity fires have greater potential to enhance and sustain a more natural and beneficial habitat.

Fire's Interaction with Surface Water Resources

Watersheds denuded by wildland fire are subject to accelerated soil erosion, reduced soil moisture, poor plant growth, and the loss of other ecosystem components. Wildland fire can also increase water temperature, alter stream channel morphology, affect floodplain functions and values, and increase nutrient and sediment loads to downstream waters. Sediment from accelerated soil erosion and elevated levels of nitrogen and phosphorous from ash are common in water after wildland fires (NWCG 2001).

Wildland fires reduce vegetation cover, especially in the short term, which intercepts precipitation before it hits the soil surface. The lack of vegetation cover on burned areas could allow precipitation to increase surface runoff, soil loss, and sediment input to surface waters. These sites could also have lower soil-water

infiltration rates, which increase surface runoff and decrease soil moisture available for plants. The seasonal timing, size, duration, and severity of fires significantly influences the magnitude of effects.

Burned watersheds generally respond to rainfall faster than unburned watersheds, potentially increasing the potential for flash flooding (Anderson et al. 1976). Water repellent soils and cover loss could cause flood peaks to arrive faster, rise to higher levels and entrain significantly greater amounts of bedload and suspended sediments.

Wildland fire could have many effects on stream habitats including changes in soil erosion, turbidity, sediment loads and nutrient loads, as well as indirect effects such as changes in dissolved oxygen concentrations and algal growth. Sediment input could reduce the area suitable for spawning or smother fish eggs with fine materials. Removal of streamside vegetation increases water temperatures, increases streambank erosion and the available streamside habitat (Monsen et al. 2004).

Fire's Interaction with Groundwater Resources

Fire can destroy accumulated forest floor material and vegetation, altering infiltration to groundwater by exposing soils to raindrop impact or creating short-term water repellent conditions (MacDonald and Huffman 2004). Burned areas could also be more susceptible to erosion, delivering minerals to recharge areas. Effects of fire on groundwater, however, are generally not substantial due to the common depth of useable groundwater (tens to hundreds of feet) in relation to the depth of fire effects on soil and recharge (inches to feet).

Fire's Interaction with Wetlands and Riparian Zones

Historically fires were an important component of the disturbance regime for watersheds and aquatic ecosystems. Fire in riparian communities would have been infrequent and varied from small size (with highly mosaic burn patterns as a result of the higher moisture content generally present in riparian areas/species) to stand-replacing burns likely to occur only in extreme drought periods. Large fires supplied woody debris and triggered hydrologic events and debris flows that transported coarse substrates to stream channels. These processes may have provided the materials that maintained productive habitats for fish and other organisms (Swanson et al. 1990).

Fire suppression and control of wildland fires have altered the natural process of periodic burning, resulting in fuel load buildups, increases in understory and brush, and increases in stand density (Wright 1990; Covington and Moore 1994). The re-sprouting ability of invasive species gives them a long-term ecological edge over native species in regard to recovery after fire. After the fires, tamarisk sprouts vigorously, while native riparian trees and shrubs generally do not.

Direct effects of fires include heating or abrupt changes in water chemistry (Minshall et al. 1989; McMahon and de Calista 1990; Rinne 1996; Beeny and Parker 1998). In the Stanislaus Complex of 1987 and other prescribed fires on the Stanislaus National Forest, Roberson noted that vigor of riparian species increased dramatically following the fires. This was partially attributed to lack of competition from adjacent vegetation (especially shading from dense, forested canopies). Indirect effects were changes in hydrologic regime, erosion, debris flows, woody debris loading, and changes to riparian cover (Swanson and Lienkaemper 1978; Megahan 1991).

Fire's Interaction with Wild and Scenic Rivers Eligibility

Fire would have impacts to the resources within the eligible area (including vegetation, fish and wildlife, soils and water, etc). Temporary disturbances may occur to visual resources and scenic values; however, these

effects would be short-term, while outstanding remarkable values are assessed on a long-term scale. High-severity wildland fire would increase the likelihood that these effects would be longer lasting and more destructive to the values identified for protection. Additional discussion of fires interaction with visual resources may be found in the Visual Resources section of Chapter 4. Fire would likely have little effect on the eligibility or suitability of a river or river segment for wild and scenic river designation.

Fire's Interaction with Wilderness Study Areas

Fire is a generally a natural part of the wilderness character (USDI and USDA 1995). Fire would have impacts on the resources within the eligible area (including vegetation, fish and wildlife, soils, and water, etc). Temporary resource and value disturbances may occur, however these effects would be short-term while wilderness values are assessed on a long-term scale. Fire would have little or no effect on the eligibility.

Fire's Interaction with Livestock Grazing

Burning of rangeland can result in an increase in the production of perennial grasses and grazing capacity. This is primarily accomplished by removal of dense stands of sagebrush and other brush species (BLM 1991). However, a short-term loss of forage may occur following a fire event. A high severity fire has the potential to extend the time frame and decrease the capability for the generation of forage on rangelands through soil sterilization and loss of the native seed bank. High severity fires may also increase the potential for undesirable forage species to extent their distribution on a rangeland. The physical destruction of allotment improvements may also occur, restricting use of the allotment until they are rebuilt. The potential for this increases with higher severity fire events, due to increased heat or fire duration around both combustible and non-combustible allotment improvement infrastructure. Mortality of livestock can occur due to the direct effects of fire. High intensity fires moving quickly would have a greater chance at causing mortality.

Fire's Interaction with Woodlands and Forestry

From a commodity standpoint, wildland fire often precludes the use of woodlands and forests for commercial products. Depending on the degree of consumption, burned wood may or may not be useful commercially. Burned trees, if only partially consumed, can still be used for firewood, lumber, pulp and some other fiber products. Wildland fire can completely consume all woodland and forest products making them unavailable for commercial uses. Even low severity fire would consume pine nuts and render some fiber unusable for certain products. In the long term, frequent, low-intensity fire would remove competing vegetation and lower branches of conifers, which would eventually produce a higher quality lumber product in the form of larger trees with fewer knots.

Fire's Interaction with Sagebrush Vegetation Type

Pre-settlement, stand-replacing fire frequencies for low-elevation sagebrush are estimated to vary from 60 to 110 years (Fire Regime II) (Whisenant 1990; Peters and Bunting 1994; Miller et al. 2001). Because of the high risk of losing key ecosystem components following fire due to cheatgrass invasion on the Vernal planning area, 100 percent of the sagebrush type is in a FRCC 3 condition.

Wyoming and basin big sagebrush do not sprout after fire and low- to high-intensity fires kill most plants. Generally, the herbaceous understory composition does not determine the intensity and severity of wildland fires—sagebrush itself is the primary fire carrier. The high canopy cover associated with late, mature sagebrush stands likely facilitated historic stand-replacing fires. A sagebrush stand with a robust understory of native grasses and forbs would generally be replaced after fire with native perennial grassland, which would have eventually progressed through seral stages to sagebrush communities. Although sagebrush does not re-sprout with fire, it is a prolific seeder (a healthy, mature plant may produce 500,000 seeds) and if a seed

source is present, re-establishment is quite rapid and dominance would occur within 20 years (Winward 1997).

In the absence of fire, sage canopy cover increases. According to Winward (2004), the maximum canopy cover for sagebrush is 30 percent; anytime canopy cover reaches more than 15 percent, the sage individuals compete with each other. Because sagebrush is a relatively short-lived species, approximately 60 years, in the absence of fire there is no recruitment of younger individuals. Consequently, the stand has the tendency to become old and decadent.

Fire's Interaction with Salt Desert Shrub Vegetation Type

Fire frequency has been estimated at 35 to more than 300 years and is historically classified as Fire Regime V. Most species of this type are not fire adapted and are considered climax the exception is threadleaf rabbitbrush (which is sensitive to competition when growing with other species but may dominate a post-burn site). Because rabbitbrush easily establishes from seed after fire, it is considered fire adaptable. Due to the risk of losing key ecosystem components and greatly increased fire regimes as invasive annual grasses dominate, salt desert shrub is typically classified as FRCC 2 or FRCC 3, depending on the relative departure from its historic fire regime (Table 3.1).

A lack of continuous cover (fuels) made fire rare to non-existent in salt desert shrub communities. Historically, these types did not burn often enough or in large enough patches to support dominance of fire-adapted plants. Most salt desert shrub species do not readily regenerate following fire. Further expansion of invasive species following fire is a major concern for salt desert shrub communities.

Fire's Interaction with Pinyon and Juniper Woodland

Most of the area where pinyon and juniper currently dominates was historically characterized by fires burning every 15 to 50 years (Kitchen 2004; Miller and Tausch 2001). Below 7,000 feet elevation, these woodlands are characterized by dense closed stands of pinyon and juniper, scarce understory, and high potential for cheatgrass invasion following fire, placing them in FRCC 3. Above 7,000 feet, these woodlands are characterized by encroached pinyon and juniper (but less dense than FRCC 3) and are at less risk of cheatgrass invasion following fire, so they are considered FRCC 2.

Old-growth pinyon and juniper is estimated to be less than 10 percent of the current area classified as pinyon and juniper woodland (Miller and Tausch 2001). Old-growth pinyon and juniper is often restricted to fire-safe habitats (e.g., steep, dissected, and rocky terrain, and in thin substrates along ridges) where they are considered climax. Fire frequency in these climax pinyon and juniper sites has been estimated at 200 to more than 300 years for old-growth pinyon and juniper (Romme et al. 2002; Goodrich and Barber 1999) and would be classified as Fire Regime V.

Because it is a non-sprouter and is thin-barked when young, fire was the major historical cause of destruction for young juniper trees. However, adult juniper trees in mature stands are difficult to burn since the understory is usually sparse (older trees succumb to fire when 60 percent of the crown is scorched). Pure juniper stands need 35 mph winds or greater to carry fire through the canopy (Winward et al. 1997). When they do ignite, these closed forests often support high intensity, stand-replacing crown fires covering large landscapes that can endanger firefighters and the general public (Keyes et al. 2003). It is generally agreed that fire was the most important natural disturbance that impacted distribution of juniper and/or pinyon and juniper woodland before the introduction of livestock in the 19th century (Miller and Rose 1999). Burkhardt and Tisdale (1976; Tirmenstein 1999) concluded that fire frequencies of 30 to 40 years would help keep juniper from expanding into mountain big sagebrush communities.

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Fire's Interaction with Mountain Shrub Vegetation Type

Stand replacing fire frequency ranges from 25 years to 100 years in mountain shrub (Gruell and Loope 1974), though return intervals may vary widely with changes in elevation, aspect, site moisture, and the associated forest or woodland type. Mountain shrubs are classified as Fire Regimes I (e.g., Gambel oak), II (e.g., mixed mountain shrub or maple), and IV (e.g., mountain mahogany), depending on the dominant species and the site. The FRCC also varies depending on the dominant species, and the understory. Mountain shrub communities at lower elevations (less than 6500 feet) are classified as FRCC 3 due to the high risk of cheatgrass invasion following fire. On the Vernal District, three percent of the mountain shrub vegetation type is in a FRCC I, whereas 97 percent is in a FRCC 2.

Some species, like oak, readily re-sprout after fire because they reproduce vegetatively. Others, like *Ceanothus*, have specialized seed, which enable it to readily invade burns (Knight 1994), while some are intolerant of fire like curl-leaf mountain mahogany, mountain big sagebrush and bitterbrush. This may cause a temporary shift in the species composition, however most mountain shrub communities generally recover rapidly following wildland fire and are considered to be fire tolerant.

Fire's Interaction with Mixed Conifer Vegetation Type

Fire frequencies in mixed conifer range from 100 to 300 years. These forests are characterized by a combination of understory and complete stand-replacement fire regimes (Arno 2000). Mixed conifer is classified as Fire Regime III or IV depending on the elevation and related dominant species. Fire Regime III would characterize conifer-shrub communities occurring at lower elevations that have pure conifer stands. Due to the longer historic fire return intervals and well-functioning vegetation attributes, mixed conifer is classified as FRCC I when associated with Fire Regime IV, and FRCC 2 when associated with Fire Regime III.

In recent years, prolonged drought has predisposed species like Douglas fir to insects (bark beetles) resulting in an increased fuel load. Dead woody fuels are accumulating, either standing and on the ground often in a haphazard manner with the greatest fuel loadings occurring on the most productive sites, which are predominantly stand-replacement fire regimes. This mixed severity fire regime often results in a mosaic pattern of stand structure and fuels. Past stand burn mosaics tend to increase the probability that subsequent fires would also burn in a mixed pattern (Arno 2000). When fires do occur, they tend to be intense and often sterilize the ground, with some 30-year-old fire scars showing very little vegetation returning .

Fire's Interaction with Riparian Vegetation

Historically, fire in these riparian communities would have been infrequent, and varied from small size, with highly mosaic burn patterns due to higher moisture content generally present in riparian areas/species, to stand replacing burns likely to have occurred only in extreme drought periods. Willow species typically sprout vigorously following a fast-moving fire because slow moving fires are generally more damaging, presumably due to greater heat transfer to root crowns. The riparian vegetation type is classified as FRCC 3 mainly due to tamarisk invasion. Because of its high water and salt content and extensive root system, fire is ineffective in the control of tamarisk and may actually encourage its growth. Light (low temperature) fire encourages tamarisk to re-sprout and become even denser, whereas hot fire would sterilize the surrounding soil so that desirable shrubs and herbaceous species are unable to get established.

Fire's Interaction with Aspen

Fire frequencies range between 25 to 100 years with mixed severity (Gruell and Loope 1974). Because of their high water content, aspen stands do not easily burn and often act as natural fuel breaks during wildland fires. Fire regimes and vegetation structure have been moderately altered from the historical conditions, mostly as a result of conifer encroachment. Because they are thin-barked, aspen-dominated sites are particularly susceptible to mortality of aboveground stems from fire of low intensity, even though aspen is well adapted to regeneration by sprouting after fire (Jones and DeByle 1985; Mutch 1970). Fires in young aspen stands tend to be low intensity surface fires unless there is a great deal of understory fuel. In older stands, during the warmest and/or driest months of the year, abundant fuel can lead to higher intensity fires. Decadent aspen stands and other areas with thin, acidic soils may be less vigorous at regenerating via suckering and may tend to support conifers even after fire (Howard 1996).

Fire's Interaction with Ponderosa Pine

Ponderosa pines have thick bark, which protects them from serious damage from surface fires. However, in the absence of fire (and an increase in grazing), ponderosa pines increase in density or other woody species like juniper or shade-tolerant firs encroach in the understory, resulting in an increased risk of crown fire. Also, increased density of shade tolerant species can place greater stress on larger old trees, mostly due to competition from other species resulting in increased susceptibility to insects and disease (Keyes et al. 2003).

Fire frequency for ponderosa pine communities ranges from 10 to 40 years with low- to mixed-severity fires (BLM 2005). These forests have typically missed between five and 10 fire cycles due to fire suppression and may have more woody vegetation in the understory.

Fire's Interaction with Fisheries and Wildlife Resources

Effects of fire on special status species and their habitat vary widely depending upon the size and intensity of the fire, fuel type, location, topography, season, and duration. High-severity wind and fire can destroy large areas of habitat and make recovery of those habitats a long process. Both low- and high-severity wildland fire

can destroy important habitat, displace animal species, and inflict direct mortality. However, low-severity fires have greater potential to enhance and sustain a more natural and beneficial habitat.

Fire's Interaction with Soil Resources

Fires affect soils primarily by consuming live or dead vegetation cover, litter, and organic soil layers, and the resulting loss of soil stabilizing organic material such as root structure. Fire may also alter soil chemical properties, post-fire soil temperatures, microorganism populations and their activity rates, erosion rates, increase nutrient availability, sterilize soil, and increase soil water repellency (NWCG 2001; Centers for Water and Wildland Resources 1996). The degree of short-term effect on these soil characteristics depends on amount of vegetation, and thickness and density of litter and organic layers. Soil texture and type, soil moisture at the time of burning, and depth and duration of heat penetration into soil horizons are also critical factors (NWCG 2001). Soil water repellency (hydrophobicity) from severe fire may substantially increase runoff and erosion, but repellency has not been found to persist for more than one year after a wildland fire (MacDonald and Huffman 2004).

The single most important factor in soil health (topsoil and nutrient loss) is the timing of vegetation recovery with the severity of precipitation rates. The potential for post-fire erosion also depends on the soil type in the area of the burn, the amount of residual vegetation and organic matter, the rate and amount of vegetation recovery, and slope. If post-fire rains are relatively gentle, some nutrients released by a fire may be reabsorbed; however, these nutrients are generally lost during severe, erosive rainfall.

Soil microorganisms (biological crusts) may be affected by heating from fire, as well as surface disturbances that compact or disaggregate these features. Disturbance of biological crusts can increase the potential for both water and wind erosion.

Fire's Interaction with Recreation

Fires can partially or completely destroy developed facilities. Fires can temporarily change the landscape in a manner that degrades visual quality and recreation opportunities and experiences. The landscape may be blackened or smoke could limit visibility. During periods of high fire danger and wildland fire activity, recreation use may be restricted or prohibited on large areas of public lands to protect public safety.

Fire's Interaction with Wild Horses and Burros

Fires would likely pose a temporary loss of resources such as forage, watering areas, and corrals. High-severity fires in or around any of the three herd management areas/herd areas (HMA/HA) could cause displacement of herds and might force the herds to seek food, water, and shelter outside of the management areas. High-severity fires have the potential to extend the time frame and decrease the capability for the generation of forage on HMAs through soil sterilization and loss of the native seed bank. Fire events may also increase the potential for undesirable forage species to extend their distribution on an HMA. Fires could benefit wild horses and burros by modifying the vegetative community to more appropriate forage. Mortality of horses or burros can occur due to the direct effects of fire.

Fire's Interaction with Wilderness Characteristics

In many cases, fire is a natural part of the wilderness character of an area (USDI and USDA 1995). Fire would have impacts to the resources within the eligible area (including vegetation, fish and wildlife, soils and water, etc). Temporary disturbances may occur to resources and values; however, these effects would be short-term while wilderness values are assessed on a long-term scale. Fire would likely have little or no effect on the wilderness characteristics of an area.

Appendix I
Biological Opinion Terms and Conditions

Terms and Conditions described in this appendix only apply to the species named in Appendix F of this document.

Incidental Take Statement

Section 9 of the Act, as amended, prohibits take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering (50 CFR § 17.3). "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3).

No exemption from Section 9 of the Act is granted in this biological opinion. BLM's implementation of the Land Use Plan Amendment and Five Fire Management Plans is likely to adversely affect listed species. The likelihood of incidental take, and the identification of reasonable and prudent measures and terms and conditions to minimize such take, will be addressed in project level, and possibly programmatic level consultations. Any incidental take and measures to reduce such take cannot be effectively identified at the level of proposed action because of the uncertainty of wildland fire, broad geographic scope, and the lack of site specific information. Rather, incidental take and reasonable and prudent measures may be identified adequately through subsequent actions subject to section 7 consultations at the project and/or programmatic scale.

Even though actual take levels are unquantifiable, take will occur through harm and harassment. Therefore, we are providing the following Reasonable and Prudent Measures (RPMs) and Terms and Conditions to minimize overall take. Implementation of these RPMs and Terms and Conditions during project planning will also expedite site-specific section 7 consultation.

REASONABLE AND PRUDENT MEASURES

The U.S. Fish and Wildlife Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle, Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shiwits milk-vetch, Holmgren milk-vetch, Kodachrome bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia:

- I. The Bureau of Land Management shall implement measures to minimize mortality or injury of the black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle, Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shiwits milk-vetch, Holmgren milk-vetch, Kodachrome bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia due to proposed project activities; without placing firefighter personnel at risk.

2. The Bureau of Land Management shall implement measures to minimize harm to the black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle, Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shiwits milk-vetch, Holmgren milk-vetch, Kodachrome bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia through destruction of their suitable or designated critical habitats; without placing firefighter personnel at risk.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Bureau of Land Management must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. The following terms and conditions apply to all species covered under this biological opinion, and are to be implemented in addition to the Applicant Committed Measures described in the Proposed Action:

General Terms and Conditions

- I. To implement Reasonable and Prudent Measure I:
 - a. Before the beginning of each fire season, a threatened and endangered species education program will be presented to all personnel anticipated to be within federally listed species habitats during suppression activities. This program will contain information concerning the biology and distribution of listed species throughout the Fire Management Plan Planning Area, their legal status, fire suppression goals and restrictions within suitable and critical habitat. Following training, each individual will sign a completion sheet to be placed on file at the local BLM office.
 - b. All project employees (including fire fighting personnel) shall be informed as to the definition of "take", the potential penalties (up to \$200,000 in fines and one year in prison) for taking a species listed under the Endangered Species Act, and the terms and conditions provided in this biological opinion.
 - c. A qualified Resource Advisor will be assigned to each wildfire that occurs in or threatens listed species habitat. The Resource Advisor's role is help define goals and objectives for fire suppression efforts and informs the Incident Commander (IC) of any restrictions, but does not get involved in specific suppression tactics. Resource advisors shall oversee fire suppression and suppression rehabilitation activities; to ensure protective measures endorsed by the Incident Commander are implemented.
 - d. For pre-planned projects, the Authorized Officer shall designate an individual as a contact representative who will be responsible for overseeing compliance with the Applicant Committed Measures and terms and conditions contained in this biological opinion, and providing coordination with the U.S. Fish & Wildlife Service. The representative will have the authority to halt activities which may be in violation of these conditions, unless human health and safety or structures are at risk, in which case the Incident Commander overseeing the wildfire suppression actions will have the final decision making authority.
 - e. Project related personnel shall not be permitted to have firearms or pets in their possession while on the project site. The rules on firearms and pets will be explained to all personnel involved with the project.

- f. If available, maps shall be provided to local dispatch centers showing general locations of listed species. Local BLM or UDWR biologists shall be consulted for specific locations if fires occur within or near the general locations delineated on the map.
 - g. Conduct pre- and post- monitoring of the response to the treatments by federally listed species.
- 2. To implement Reasonable and Prudent Measure 2:
 - a. Fingers or patches of unburned vegetation within burned areas shall not be burned out as a fire suppression measure unless required for safety concerns.
 - b. Emergency Stabilization and Rehabilitation efforts must focus on areas in the spread of non-native species particularly within suitable habitat for federally listed species. The specific seed mix for use within suitable habitat for federally listed and sensitive species will be determined through coordination and section 7 consultation with the U.S. Fish and Wildlife Service.
 - c. Recovery of vegetation shall be monitored, including establishment and monitoring of paired plots, inside and outside of the burned area unless the BLM and the Service concur that monitoring is not required.
 - d. Site-specific projects under the Land Use Plan Amendment and Fire Management Plans shall specifically recognize the primary constituent elements necessary for functional critical habitats to ensure consistent application of measures to maintain these features in all implementation activities.
 - e. The effectiveness of suppression activities and threatened and endangered species conservation measures shall be evaluated after a fire in coordination with the U.S. Fish and Wildlife Service. Procedures shall be revised as needed.
 - f. Conduct pre- and post-monitoring of threatened or endangered species' habitat conditions.
 - g. Temporarily close off highway vehicle (OHV) trails after a fire event until vegetation and soils recover.
 - h. Obscure decommissioned trails and roads and illegal OHV trails after a fire event to prevent re-opening.

Black-Footed Ferret and Utah Prairie Dog

- I. To implement Reasonable and Prudent Measures 1 and 2:
 - a. Wildfires will be suppressed before they reach a prairie dog colony¹ or after they exit a colony. Active suppression efforts will not occur within a colony unless human health and safety or structures are at risk.
 - b. Only hand lines will be authorized within colonies.
 - c. Normally, only water shall be used on fires that occur within prairie dog colonies. If the fire Incident Commander decides that the situation requires use of chemical retardants in order to protect life and property, they may be used. The chemical composition will be supplied to the U.S. Fish and Wildlife Service during formal consultation.
 - d. All vehicles shall stay on existing roads within colonies, except as stated in (e). Storage of equipment and materials shall not occur within ¼ mile of colonies. Vehicle maintenance shall not occur within these areas.
 - e. If the situation would require vehicles to travel cross country within prairie dog colonies, this activity shall be cleared by an on-site biologist prior to occurring. Vehicles shall not exceed a speed of 10 miles per hour (cross country) in occupied Utah prairie dog colonies unless a higher speed is determined to be prudent for safety reasons.

¹ "Prairie dog colony" refers to any occupied Utah prairie dog colony or any prairie dog colony within the range of the black footed ferret.

- f. Within colonies, precautions shall be taken to ensure that contamination of the site by fuels, motor oils, grease, etc. does not occur and that such materials are contained and properly disposed of off-site. Inadvertent spills of petroleum based or other toxic materials shall be cleaned up and removed immediately.
- g. Camps associated with fire suppression activities shall be situated outside suitable habitat.
- h. If a dead or injured Utah prairie dog is located, initial notification must be made to the Service's Division of Law Enforcement, Cedar City, Utah at telephone 435-865-0861 or to the Cedar City office of the Utah Division of Wildlife Resources at telephone number 435-865-6100. Instruction for proper handling and disposition of such specimens will be issued by the Division of Law Enforcement. Care must be taken in handling sick or injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state.
- i. For the black-footed ferret, avoidance and minimization measures that should be followed are included within the *Cooperative Plan for the Reintroduction and Management of Black-Footed Ferrets in Coyote Basin, Uintah County, Utah* published by the Utah Division of Wildlife Resources in September, 1996. These measures may be updated based on the best available scientific data as it becomes available.

Canada Lynx

- I. To implement Reasonable and Prudent Measures 1 and 2:
 - a. The Lynx Conservation Assessment and Strategy (LCAS) shall be incorporated into project plans as appropriate, and any applicable standards, guidelines, and objectives specifically related to linkage habitat would be followed during implementation of fire management activities.

Southwestern willow flycatcher

- I. To implement the Reasonable and Prudent Measure 1:
 - a. Prior to planned project activities, action areas will be surveyed according to U.S. Fish and Wildlife Service protocol.
 - b. Except where fires are active in occupied habitat, minimize unnecessary low-level helicopter flights during the breeding season (April 1 – September 30). If safety allows, approach bucket dip sites at a 90-degree direction to rivers to minimize flight time over the river corridor and occupied riparian habitats. Locate landing sites for helicopters at least ¼ mile from occupied flycatcher habitat unless human safety or property dictates otherwise.
 - c. Minimize use of chainsaws or bulldozers to construct fire lines through occupied or suitable habitat except where necessary to reduce the overall acreage of occupied habitat or other important habitat areas that would otherwise be burned.
 - d. Implement activities to reduce hazardous fuels or improve riparian habitats (prescribed burning or vegetation treatments) within occupied or unsurveyed suitable habitat for southwestern willow flycatchers only during the non-breeding season (October 1 to March 31).
- 2. To implement Reasonable and Prudent Measure 2:
 - a. Riparian fuel reduction actions shall be considered as experimental, and initially conducted only in unoccupied habitats until the success and ramifications are better understood. Efficacy of these actions as a fire management tool, and effects on bird habitat quality, shall be tested in a scientifically explicit, controlled fashion (Appendix L in U.S. Fish and Wildlife Service 2002).
 - b. In occupied or suitable flycatcher habitat, creation of fire breaks might render the habitat unsuitable (Appendix L in U.S. Fish and Wildlife Service 2002). Therefore, fire breaks

shall first be conducted only in unoccupied sites, outside of proposed critical habitat, or within the following situations, as long as human safety and property allows:

- i. Along grass-edged roadways;
 - ii. Where large areas of fire-prone vegetation, unsuitable for flycatcher breeding, separate a breeding site from potential ignition sources or high frequency fire areas; and
 - iii. Between agricultural “burn areas” and flycatcher sites to prevent brush-pile fires from spreading into breeding sites (Appendix L in U.S. Fish and Wildlife Service 2002).
- c. Controlled burns shall be avoided in occupied habitat and considered only as experimental management techniques if dealing with suitable unoccupied habitat (Appendix L in U.S. Fish and Wildlife Service 2002).
 - d. Fires in occupied habitat and adjacent buffer zones shall be rapidly suppressed.

California Condor and Bald Eagle

- I. To implement the Reasonable and Prudent Measure 1:
 - a. If California condors or bald eagles are found inhabiting (nesting) within the action area, a buffer of 1 mile surrounding the nesting area will be designated as non-treatment zones (Romin and Muck 2002).
 - b. Open water sources such as “pumpkin” inflatable water storage tanks will be covered when not in use.

Mexican Spotted Owl

- I. To implement Reasonable and Prudent Measure 1:
 - a. Pre-planned fuels reduction projects within Mexican spotted owl primary activity centers (PAC) shall be designed to enhance habitat requirements for the Mexican spotted owl as well as for the valuable prey species they rely upon. Any project within a PAC requires additional section 7 consultation.
2. To implement Reasonable and Prudent Measure 2:
 - a. Fire suppression shall be considered for wildfires in PACs.

Desert Tortoise

- I. To implement Reasonable and Prudent Measure 1:
 - a. Campsites, aircraft landing and fueling areas, staging areas, and helicopter dip sites shall either be located outside of desert tortoise habitat or cleared by the Resource Advisor or tortoise biologist.
 - b. Hand crews shall be used to build and defend fire lines. Engines can be used for support from roads. Wherever practical, fire engines must remain on roads and lay fire hose only along hand lines.
 - c. The Resource Advisor, tortoise biologist, or biological monitor (someone who is either qualified with a biological background or has been trained by the Resource Advisor) ensures that tortoises, burrows, and shelter sites are protected or avoided by walking in front of engines, tracked vehicles, or other fire fighting related vehicles within the critical habitat.
 - d. On-road travel shall be restricted to speeds (25 mph) that allow drivers to distinguish obstacles such as a rocks and tortoises.
 - e. Firefighters shall note locations and condition of desert tortoises and carcasses, but must not attempt to touch or move them unless the animal is in immediate danger from fire or is on a road that is receiving traffic use. Firefighters shall be encouraged to provide notes to tortoise Resource Advisor or tortoise biologist.
 - f. Garbage and trash must not be left in project vicinity.

2. To implement Reasonable and Prudent Measure 2:
 - a. Wildfires that occur in tortoise habitats shall be suppressed as soon as possible due to the habitat changes associated with wildfire that alter food availability and the availability of plants for protection from thermal extremes and predators.
 - b. Tracked vehicles have long-lasting impacts on desert soils and vegetation, and therefore their use shall be restricted to improving roads or constructing lines where a short distance of line might save a large area from fire.
 - c. Rehabilitation of suppression related actions must be coordinated with the Resource Advisor to avoid further impacts. For example, the rehabilitation of lines created on the sensitive desert soils may cause more damage than the initial suppression actions. Obliterate vehicle tracks at the point they leave existing roads to prevent those tracks from becoming future trails and roads.

Lahontan Cutthroat Trout

To implement Reasonable and Prudent Measures 1 and 2, we recommend full implementation of the Memorandum of Understanding (MOU) between the BLM, Service, Utah Division of Wildlife Resources, and Utah Division of Forestry, Fire and State Lands. The purpose of this MOU is to provide a framework of cooperation for interagency fire management between the Bureau of Land Management (Salt Lake and Elko Field Offices), U. S. Fish and Wildlife Service (Region 1 and Region 6), and the Utah Department of Natural Resources (Division of Wildlife Resources and Division of Forestry, Fire, and State Lands), within the Bettridge and Morrison Creek drainages of the Pilot Mountains. This MOU contains Standard Operating Procedures to be used for the protection of the threatened Lahontan cutthroat trout and their habitat during fire suppression and rehabilitation activities in these two drainages. The Standard Operating Procedures developed through the MOU are listed below.

- I. Standard Operating Procedures for Suppression Activities:
 - a. Avoid the application of retardant or foam within 600 feet of the stream channel or waterway. With the exception of restricting the use of retardants and foams to 600 feet from stream channels or waterways, aerial application and use of retardants and foams will be consistent with national policy guidelines established by the National Office of Fire and Aviation, as amended.
 - i. The exceptions to this procedure are:
 1. When alternative line construction tactics are not available due to terrain constraints, congested area, life and property concerns or lack of ground personnel, it is acceptable to anchor the foam or retardant application to the waterway. When anchoring a retardant or foam line to a waterway, use the most accurate method of delivery in order to minimize placement of retardant or foam in the waterway (e.g., a helicopter rather than a heavy air tanker).
 2. Deviations from these guidelines are acceptable when life or property is threatened and the use of retardant or foam can be reasonably expected to alleviate the threat.
 3. When potential damage to natural resources outweighs possible loss of aquatic life, the unit administrator may approve a deviation from these guidelines. This determination will be made on a case-by-case basis by the Field Manager or the designated Field Manager representative in consultation with the Fire Management Officer, Incident Commander, Resource Advisor, and BLM Field Office Fisheries Biologist through development of the Wildfire Situation Analysis.
 - b. Do not draft fill engines that have surfactant foam mixes in tanks, directly from the stream channel.

- c. A containment barrier will be constructed around all pumps and fuel containers utilized within 600 feet of the stream channel to prevent petroleum products from entering the stream. The containment barrier will be of sufficient size to contain all fuel being stored or used on site.
 - d. Do not dump engines filled with surfactant foam mixes within 600 feet of the stream channel.
 - e. Do not conduct retardant mixing operations within 600 feet of the stream channel.
 - f. Stream flow will not be impounded or diverted by mechanical or other means in order to facilitate extraction of water from the stream for fire suppression efforts.
 - g. The intake end of the draft hose will be screened to prevent entrainment of fish species. Screen opening size will be a maximum of 3/16 inch.
 - h. Before each fire assignment in the Elko and Salt Lake Districts, all fire suppression equipment utilized to extract water from stream or spring sources (i.e. helicopter buckets, draft hoses and screens) will be thoroughly rinsed to remove mud and debris and disinfected with a chlorine solution (one part bleach to 32 parts water, or stronger). Rinsing equipment with disinfectant solutions will not occur within 600 feet of natural water sources (streams or springs).
 - i. Only water sources identified as specified dip sites will be used to control and/or contain fire with the Bettridge and Morrison Creek drainages. Water may be obtained from the pond on the TL Bar Ranch (Donner Springs). The coordinates of this dip site are: N 41 01 22.6 X W 113 58 04.3.
 - j. Water extraction from streams currently occupied by LCT (including beaver ponds) is restricted.
 - k. Fire control lines will not cross or terminate at the stream channel. Control lines will terminate at the edge of the riparian zone at a location determined appropriate to meet fire suppression objectives based on fire behavior, vegetation/fuel types, and fire fighter safety.
 - l. Access roads and/or fords will not be constructed across the stream channel.
 - m. New roads or mechanical fire control lines will not be constructed and existing roads will not be improved within 600 feet of the stream channel unless authorized by the Field Manager or the designated Field Manager representative.
2. Standard Operating Procedures for Rehabilitation Measures:
- a. An assessment of the impacts of fire and fire suppression activities to LCT habitat will be completed by an interdisciplinary team of resource specialists, including the Elko and Salt Lake BLM Field Office Fisheries Biologists and Hydrologists, representatives from the Service, representatives from the Utah Division of Wildlife Resources, and representatives from Utah Division of Forestry, Fire and State Lands. Based on this assessment, appropriate rehabilitation measures will be identified consistent with Departmental Emergency Stabilization and Rehabilitation Handbook guidance, including but not limited to some or all of the following:
 - i. Where determined necessary by the interdisciplinary review team, a post-fire contingency plan for immediate and effective protection, rescue, and rehabilitation of, and minimization of risk of injury to LCT populations and their habitat will be created.
 - ii. Close the affected watershed and/or stream channel to livestock grazing for two or more growing seasons to allow for recovery of riparian vegetation. The appropriate length of time for closure to livestock grazing will be determined on a site specific basis based on resource data, scientific principles, and experience. Site specific monitoring will determine when resource objectives have been achieved on specific burned areas. Site specific vegetative recovery objectives will be identified by the

interdisciplinary review team and included in the Notice of Closure to Livestock Grazing issued in accordance with 43 CFR 4110.3-3.

- iii. Reconstruct damaged fences and/or construct new fences to ensure protection of the stream channel from grazing. In Wilderness Study Areas, fence construction and/or reconstruction will be in accordance with Interim Management Policy Guidelines.
- iv. Monitor stream and riparian habitats to allow for comparison of post-fire impacts to existing baseline information.
- v. Where determined necessary by the interdisciplinary review team, install appropriate erosion control structures (i.e. erosion matting and/or straw bale structures, straw wattles, etc.) to mitigate overland flow effects to the stream channel.
- vi. Where determined necessary by the interdisciplinary review team, reseed and/or replant riparian/wetland areas with native plant species to facilitate re-establishment of perennial vegetation, minimize potential channel erosion, and allow for recovery of riparian functionality.
- vii. Rehabilitate improved roads located within 600 feet of the stream channel as determined necessary to mitigate potential sedimentation into the stream channel.
- viii. Implement appropriate integrated noxious weed control measures where determined necessary by the interdisciplinary review team and/or where determined appropriate through post-fire monitoring.
- ix. Where determined necessary by the interdisciplinary review team, initiate temporary road closures for at least one year to protect and stabilize burned areas and associated watersheds. An interdisciplinary assessment will be conducted after the first year to determine if road closures are still needed.

Threatened or Endangered Plants

1. To implement Reasonable and Prudent Measure 1:
 - a. Do not allow wildland fire use or prescribed fire activities within suitable, occupied habitat.
 - b. When feasible (human life or property are not at risk) fire breaks shall be constructed down slope of plants and populations; if fire breaks must be sited upslope, buffers of 100 feet minimum between surface disturbances and plants and populations will be incorporated.
2. To implement Reasonable and Prudent Measure 2:
 - a. Do not allow wildland fire use or prescribed fire activities within suitable, occupied habitat.
 - b. For pre-planned projects within known or potential habitat, site inventories shall be conducted to determine habitat suitability prior to initiation of project activities, at a time when the plant can be detected, and during appropriate flowering periods, and will include, but not be limited to, plant species lists and habitat characteristics.
 - c. For riparian/wetland-associated species, e.g. Ute ladies-tresses, avoid loss or disturbance of riparian habitats:
 - i. Ensure that water extraction or disposal practices do not result in change of hydrologic regime.
 - d. Limit disturbances to and within suitable habitat by staying on designated routes.
 - e. Limit new access routes created by the project.
 - f. Place signing to limit ATV travel in sensitive areas.
 - g. All disturbed areas will be re-vegetated with native species comprised of species indigenous to the area.

- I. To implement Reasonable and Prudent Measures 1 and 2:
 - a. During wildland fire events, do not suppress wildland fire within the extremely sensitive soils (Chinle formation) unless another threatened or endangered species (i.e. desert tortoise), or life or property are at risk.
 - b. Do not seed within the Chinle formation.
 - c. Do not rehabilitate areas impacted by suppression activities, such as hand lines, areas that may have been trampled, or areas that may have been impacted by fire retardant drops.
 - d. The effects of any fire or suppression activity within suitable habitat for the Shivwits milk-vetch will be monitored as these measures have not been tested. These measures are based on the sensitive nature of the soils that support the plant. Up-dating and fine-tuning methods to implement during wildland fire events and post emergency stabilization and rehabilitation activities shall rely upon adaptive management techniques.

Siler Pincushion Cactus

- I. To implement Reasonable and Prudent Measures 1 and 2:
 - a. Follow and implement the restrictions to pesticide use within suitable Siler pincushion cactus habitat developed by the Environmental Protection Agency (EPA). These limitations were excerpted from the EPA's Pesticides: Endangered Species Protection Program (<http://www.epa.gov/oppfead1/endanger/arizona/cocon.htm#brady>):
 - i. If the active ingredient is 2, 4-D (all forms), ATRAZINE, CLOPYRALID, DICAMBA (all forms), DICHLORPROP (2, 4-DP), HEXAZINONE, MCPA (all forms), PARAQUAT, PICLORAM (all forms), or TEBUTHIURON, then do not apply this pesticide in the species habitat. For ground applications do not apply within 20 yards of the habitat, or within 100 yards for aerial applications.
 - ii. If the active ingredient is OXYFLUORFEN (granular or non-granular), then do not apply this pesticide in the species habitat. For ground applications do not apply within 100 yards of the habitat, or within 1/4 mile for aerial applications.
 - iii. If the active ingredient is either METRIBUZIN or SULFOMETURON METHYL, then do not apply this pesticide on rights-of-way in the species habitat.

Colorado River Fishes (Colorado Pikeminnow, razorback sucker, humpback chub, bonytail) and Virgin River Fishes (Virgin River Chub and woundfin)

The BLM has incorporated Applicant Committed Resource Protection Measures into their plan that will minimize mortality or injury to these listed fish species.

Closing

The Service believes that an unquantifiable amount of incidental take will occur in the form of harm and harassment as a result of the proposed actions. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed actions. If, during the course of the actions, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Bureau of Land Management must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

REPORTING REQUIREMENTS

Upon locating dead, injured, or sick listed species, immediate notification must be made to the Service's Salt Lake City Field Office at (801) 975-3330 and the Service's Division of Law Enforcement, Ogden, Utah, at (801) 625-5570. Pertinent information including the date, time, location, and possible cause of injury or

mortality of each species shall be recorded and provided to the Service. Instructions for proper care, handling, transport, and disposition of such specimens will be issued by the Service's Division of Law Enforcement. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state.

The BLM shall submit a report to the Service on or before (December 1) of each year in which fire management activities occurred within occupied habitat. For the listed and candidate species covered under this consultation, the report shall include: 1) the amount of potential and/or occupied habitat affected by wildfire (i.e. stream miles burned, percentage of drainage burned, fire severity map); 2) to the extent possible, the number of individuals killed from direct and indirect effects of wildfire; 3) any habitat and/or population monitoring efforts from past wildfire events; 4) a copy of the burned area emergency stabilization and rehabilitation plan; 5) implementation and effectiveness monitoring of burned area emergency stabilization and rehabilitation treatments; 6) implementation and effectiveness monitoring of the standard operating procedures; 7) recommendations for enhancing the effectiveness of the standard operating procedures; and 8) any recommendations for additional standard operating procedures. The first report shall be due to the Service on (December 1, 2005). The address for the Utah Fish and Wildlife Office is:

Field Supervisor

U.S. Fish and Wildlife Service

2369 West Orton Circle, Suite 50

West Valley City, Utah 84119

Telephone: (801) 975-3330